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Title: Singing Beasts: The Animal in Opera

Summary:

This practice-led project examines opera in light of the current critical attention to animals, both real and metaphorical, and their often hidden or overlooked presences in human culture.

Despite their near ubiquity in our lives, animals have only recently become the subjects of serious intellectual inquiry, and the field of animal studies is a rapidly-evolving discipline, with scholars like Keith Thomas and Harriet Ritvo considering animals as active participants in human lives and histories. Opera as a form has always concerned itself with meetings between the human and the not-human; Orpheus, the semi-divine hero of the earliest operas, subdues both gods and wild beasts through his music. It is therefore curious that no serious study of opera in relation to animals and animality has yet been undertaken. For the first part of this project I have been examining the extensive representation of animals in opera over the 400 years of its existence to understand the changing forms and meanings of animals in opera.

The voice is central to opera, and a closer consideration of the voice as the locus of human and non-human difference reinvigorates the debate about operatic representation, reinforcing opera's status as the ultimate humanist art form while exposing the vulnerability of this position in an era when humanism itself is increasingly called into question. A synthetic opera-animal approach casts important light on some concerns which are central to both fields: the porous, shifting boundary between human and non-human animals (and the way in which mimesis and performance further reinforce or erode those boundaries, building on work by Ritvo and Erica Fudge, Deleuze and Agamben); questions of anthropomorphism and authenticity as addressed by Steve Baker; notions of wonder, the metaphysical, and the uncanny as explored by Abbate and Tomlinson; even the politics and ethics of performance-as-animal.

Practical research is also central to this project, which explores, through a portfolio of documented workshops and performances, the opportunities and necessities occasioned by the creation of a new post-human music theatre that articulates and confronts head-on our own animality, moving beyond a modernism which defines itself in opposition to the animal. In fact, as public discourse turns more and more to the sciences rather than to the arts for answers to the fundamental questions of human and animal nature, animal-opera is an obvious territory on which these two epistemological frameworks, scientific and artistic, can coexist - or collide - revealing how animals might be regarded not simply as passive carriers of imposed human meaning, but generators of meaning in their own right.

The main project realised through this process of experimentation is *Arthropoda*, a collection of works based on the life stories of arthropods. The choice of animal is not arbitrary - their phylogenetic distance, their problematic bodies, their simultaneous familiarity and utter alienness supply particular representational challenges beyond those of more easily anthropomorphised creatures. The first work from this series, *Phthirus*, a cantata for human singers as human parasites, has underlined some of the limitations of traditional anthropomorphic representations, while new developments in the field of insect communication have suggested radical new directions that push the boundaries of opera as a form. A reconfigured examination of animal lives and bodies offers new source material,

such as the bizarre lifestyle of the parasitic barnacle *Sacculina*; new musical dramaturgies, in the repurposing of entomological classics as performance texts; even new ways of producing and perceiving musical sound, such as the tymbalum, a biomimetic musical instrument based on cicada physiology. Each of these approaches seeks to bridge the perceptual divide between human and arthropod.

I hereby declare that this thesis has not been, and will not be, submitted in whole or in part to another University for the award of any other degree.

Signature:.....

Singing Beasts: Opera and the Animal

by

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Prologue:

I spent most of the four summers until I was seventeen in windowless rooms, an entomological dogsbody at the Smithsonian Institution, working on a taxonomical production line. I was assigned first to the vast, uncatalogued Alexander collection, a resource unrivalled in the study of Tipulids.

For all its exotic beauty, the language of science aspires not to poetry but to precision. Since 1966, thanks to Willi Hennig's Phylogenetic Systematics, this precision does not merely indicate membership of a species, but marks out a place in evolutionary history, confirms the commonality of all life on Earth.¹

Those unfamiliar with the Tipulidae might know them by their ambiguous, imprecise, if equally evocative names – 'crane flies', 'mosquito-hunters', or even the problematic 'daddy-longlegs'.



Figure 1: Tipula lunata, photographed by Malcolm Storey, 2015.

The name is problematic because it is also a common English name for the Pholcid spider, while for most (but not all!) Americans, the daddy long-legs is yet another arachnid (Opilio) whose vernacular name elsewhere tends towards 'harvestman'.

Lest smugness over the precision of science's exclusive vocabulary reign, it is worth considering Linnaeus's use of Phalangium for the same creatures, which caused an entomological quarrel that prickled in scientific journals for half a century, until Jean Frédéric Hermann (posthumously) settled the argument by deferring to the French vernacular faucheur, tacitly admitting the superiority of folk knowledge over the much-celebrated achievements of rational natural philosophy.²

Despite this, the assertion would persist that 'Since uneducated rustics do not have a taxonomist's precision of reference and terminology, we may have quite complex problems to deal with when investigating the vocabulary relating to plants, animals, and

¹ Hennig, 1966.

² Kury, 2010.

insects.'³

When I left the world of entomology to study music, I had no idea that I was stepping from one museum into another. The work I was doing at the Museum of Natural History would be a parallel to my work with notes on the page, sounds in my head and irresistible urges to speak and move. I didn't know at the time I was playing out the Modern predisposition, when confronted with the exuberant and bewildering, nearly shameless diversity of life, to capture, catalogue, sort, label, classify, rationalise, control.

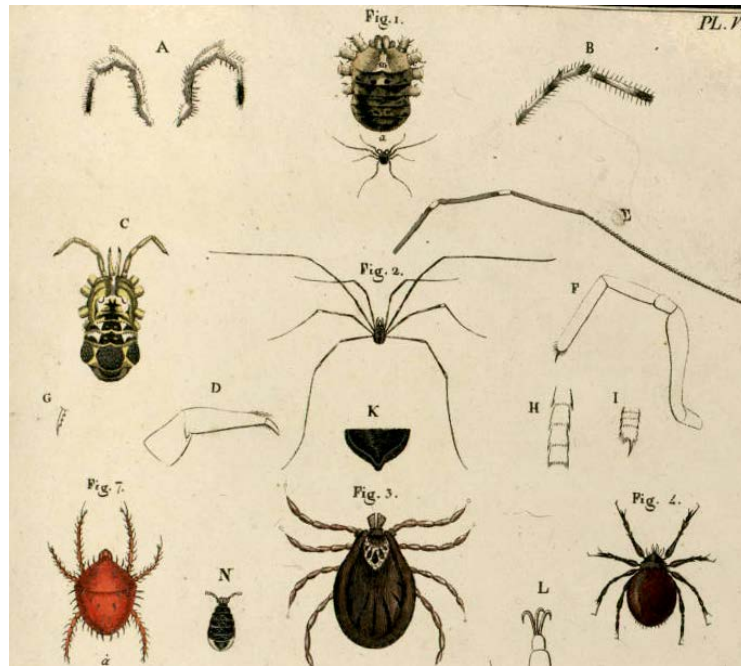


Figure 2: The faucheur (fig. 2, centre) and other arachnids. From Mémoire aptérologique, 1804.

³ Francis, 1959: 245.

Introduction

‘Singing Beasts’ is an investigation into the intersections between the two relatively new fields of Animal and Opera Studies, with a focus on what an animal studies perspective might have to offer to operatic practice in the 21st century.

Animal Studies is as much an analytical perspective as a field of inquiry, and is necessarily an interdisciplinary pursuit, and while defining (or at least naming) the object of inquiry for Opera Studies is relatively straightforward, the scope of animal studies is less obvious.⁴ Performance theorist Jennifer Parker-Starbuck describes the field as ‘largely preoccupied with Western philosophical models and how these models have too often represented a disregard for the animal’.⁵ The term ‘non-human animal’ proves useful to a point, but the apparent precision of ‘non-human’ conceals as much as it reveals. Such a definition, while announcing a deliberate move away from anthropocentric discourse, disingenuously ignores its own anthropocentrism. The category ‘human’ relies on the animal to define its boundaries, rendering ‘non-human animal’ a tautology. And while this term can serve as an important corrective to the Enlightenment fiction of ‘non-animal humanity’, its use can disguise the necessary preoccupation much of animal studies discourse has with so-called ‘humanity’: the animal heritage of the human species, or the beast inside. Animal studies frequently exposes, and suffers from, such lexical inadequacy.

I have interpreted ‘the animal’ in the broadest way, in an effort to draw attention to the wide variety of collisions between the two disciplines. In addition, the inevitable ethical dimension to such a study demands engagement with the bio- or ecopolitical concerns of animal studies as much as its literary or historical aspects, aligning it with the field of Critical Animal Studies – the activist wing of Animal Studies as a whole.

I hope this study will present a number of fertile directions for scholars in both areas, opening the texts and cultural practices of opera to animal studies scrutiny as well as demonstrating some of the ways forward suggested by an “animal turn” in opera theory and practice.

⁴ The boundary of ‘opera’ does remain the subject of debate. I adopt two different definitions of opera while excluding the rest. My discussion of opera in theory and history, in the first two chapters, adopts the usefully tautological ‘anything performed in an opera house by an opera company’ attributed to Stephen Sondheim. In discussions of my own or other contemporary work, I use an experiential rather than material definition: a work in which vocal performance is used to produce an experience of the operatic, a term I shall define more robustly in my discussion of *Arthropoda*.

⁵ Parker-Starbuck, 2015: 9.

Opera has long been acknowledged as a site where prevailing philosophical debates are put into practice, and opera itself is arguably the product of Renaissance practice-as-research. Yet, like Opera Studies, practice-as-research is also comparatively new to formal academia, and takes in a range of interdisciplinary working practices, broadly definable as research into practice, research for practice, and research through practice. Taking advantage of this negotiable methodology, I have adopted elements of all three in ‘Singing Beasts’.

Research into practice takes the form of a survey of confrontations with the animal in the opera repertoire, both as animal characters and the animality of the human. No work can be divorced from its own creative heritage, and opera in particular, with the longest continuous history of any large-scale western artistic form, demands a consideration of what came before. I also consider the work of other contemporary artists and performance makers in the context of my own pieces presented here.

The broadly chronological use of operatic examples may give the impression that I am constructing an animal metanarrative for the history of opera, but these historical, philosophical, and theoretical excursions must be seen in the light of my role as a creative practitioner. My aim in this regard is to reveal how the exclusion of animal characters is a missed opportunity, brought on by an adherence to the social conventions and dominant ideologies of opera, and it is the shifting ideologies of the Modern that supply the pseudo-metanarrative background.

In some ways, this is a retrospective justification of an instinct connected to my own biophilic inclinations, that the opera stage is (or could be, should be) a natural habitat for the singing beast, just as in the eighteenth century it was the last refuge of the marvellous. In fact, the animal’s place in opera is doubly confirmed – first, by the close association of the animal presence with natural magic and a sense of wonder, both of which found themselves squeezed out by rational materialism; and conversely, by the connection between the animal absence to the disenchantment of modernity, which has been identified as a source of opera’s ills.

In the first section, I examine opera history and theory with a theoretical framework drawn from Animal Studies, with a particular emphasis on the appearance (or otherwise) of animal characters in the repertoire. Although the literature on animals is growing rapidly, the key works in this sub-discipline are concerned primarily with the presence of real animals in the context of animal performance.⁶ Though I touch briefly on this subject in my discussion of Venetian opera, it is the under-considered representation of animals by

⁶ See, for example Peterson, 2007; Parker-Starbuck, 2015.

human performers that is my particular concern. While this is not intended as an exhaustive historical survey of animal opera, even a cursory glance reveals a glaring lack of such representations. Given their near-ubiquity in human cultural production, any such examination must thus account for this animal absence.

Chapter one, 'Orpheus among the Animals', highlights the disjunction between Orpheus iconography, in which animals play an indispensable role, and the seeming unwillingness of opera makers to commit to the re-enactment of one of Orpheus's defining moments. This exclusion of animals comes about as a result of anthropocentric priorities as well as the score-based nature of the opera record.

Chapter two, 'A Theatre of Wonder in the Age of Reason', considers the shift away from the natural magic of the Renaissance to the disenchantment of the Modern, and the ways this shift is manifested in opera's engagement with the natural world. I focus on the experience of wonder, which I identify as a poorly-understood yet fundamental element of the operatic. Two operatic confrontations with animal-human difference – the characters of Papageno in *The Magic Flute* and the Woodbird in Wagner's *Siegfried* – stand as evidence of the role played by animal opera and the biophilic impulse in an immanent critique of Enlightenment that continues to this day. In addition, I examine the new insights offered by a human-animal studies approach, particularly one which acknowledges the animal nature of humans, into two of opera's most persistent preoccupations: the speech-song boundary and the nature of the singing voice.

In this section, in particular, I invoke a number of potentially contentious concepts – most notably, those involving the role of mind, reason, language, and meaning in identifying what lies on either side of the human/animal boundary. I challenge the notion of human exclusivity by an examination of the operatic voice, seeking not to resolve the paradoxes of the dominant Cartesian worldview but to expose them, and to demonstrate that opera is a place where these inconsistencies have always been on display. My own view (unpacked more fully in the later parts of this thesis) relies on cognitive and biological sciences, resting on the notion (supported by anatomy and physiology) that while humans are not separate from the animals, they are nonetheless distinct, and that this distinction rests most notably in our use of a discrete combinatorial communication system called 'language'.⁷ Drawing as I do on so many disciplines, each with its own subtle use of similar terminologies (such as the distinction made between 'meaning' and 'meaningfulness' found in cognitive linguistics, to name but one) I would humbly request my reader to understand such notions

⁷ For details, see Sebeok, 1965; Deacon, 1997; Fitch, 2006.

as ‘mind’, ‘reason’, or even ‘animal’ in the vernacular sense, except where specifically qualified in the text.

The second part is an examination of animal opera in practice, with a focus on a collection of my own pieces, collectively titled *Arthropoda*. The subtitle, ‘forays into the world of animal opera’, is a nod to an animal studies classic, Jakob von Uexküll’s *Foray into the World of Animals and Men*, and gives some hint as to my approach.⁸ These works all start with arthropods as their point of departure, and music theatre as the means of travel, but take different directions, and arrive at sometimes unlikely destinations. The first and most cautious of these excursions is *Life Stories*, a suite of three miniatures documented as scores, which use insect lives as a source of narrative.

My primary concern in these three pieces was to identify through practice the difficulties faced in creating insect characters using traditional opera means, with a particular focus on the challenge to authenticity and spectator identification presented by the ontological anthropomorphism of performance-as-animal, or more colloquially, ‘the animal suit problem’. These first forays demonstrate the ways in which the operatic communication of insect lives demands a reconsideration of operatic convention while retaining essential elements of the operatic, particularly the experience of wonder.

Concerned not to make a gratuitous break with tradition, I sought inspiration in the earliest operas and the figure of Orpheus, and created the sound installation *Sacculina* as a conscious gesture towards the re-enchantment of operatic form. The centrepiece of the installation was an encounter between human spectators and live crabs, and I use the experience of *Sacculina* to address the effects of the use of live animals on the creation and reception of post-operatic music theatre.

The consideration of musical function rather than musical form in *Sacculina* leads to my last reconsideration of Orpheus, and an attempt to retain opera’s heritage in myth whilst dispensing with some of its stifling conventions, by replacing Orpheus with another mythological musician, Eunomos. In comparing the Orphean and Eunomic paradigms of performance, I establish Eunomic principles to offer guidance on further forays into insect opera. Most important among these are collaboration, spontaneity, and participation – features found not in the opera score, but in performance.

From Eunomos’s cicada, the next foray takes us further into the world of cicada sound production. Exploring mimesis by other means, I bypass the animal suit problem without

⁸ von Uexküll, 2010.

sacrificing the human performer. Considering the insect body as the source of insect sound led to the construction of a biomimetic musical instrument. The Tettix models an intricate acoustic system with the simplest of possible material means, and reveals another crucial aspect of the Eunomic programme – the celebration of inadequacy.

Inadequate means with wondrous outcomes are the objects of the last forays, which also reconfigure some of the core relationships in the opera-making process, between composer, subject, score, performer, and audience. *The Cricket Seeks a Mate* is an unrehearsed, participatory encounter between humans performing as crickets. Here I propose a refinement of the descriptive/prescriptive distinction in light of the use of the found performance text.

The last two performances under consideration are drawn from Frej Ossiannilsson's *Insect Drummers*, a taxonomic study of Swedish leafhoppers (relatives of cicadas). These pieces present a challenge to traditional score-centred musical practices, and the attendant notions of authorship, virtuosity, and fidelity, which I examine through the process of creating *The Influence of Light and July, 1945-47*.

After a return to opera history to consider the persistence of opera's engagement with the animal, comparing *La Calisto* with one of the newest additions to the mainstream repertoire, Harrison Birtwistle's *The Minotaur*, I conclude with thoughts on the role of animal opera as a mode of post-operatic practice, and suggest some other directions for further excursions into the world of animal opera.

Chapter 1: Orpheus among the Animals

It is hard, if not impossible, to overestimate the importance of the Orpheus myth to opera, as both source material and framework for understanding. He presided over the birth of opera, however it might be defined, and is consistently invoked at times of great change, crisis, or redefinition. Theodor Adorno stated bluntly that ‘Orpheus *is* opera.’⁹

Although the figure of Orpheus would undergo countless reimaginings throughout his two-and-a-half-thousand-year history, his story as we know it comes to us primarily from two second-hand classical sources – Ovid’s *Metamorphoses* and Virgil’s *Eclogues* – both of which are drawn from a single, now-lost Greek source.¹⁰ In these two influential retellings, Orpheus, son of Apollo and the muse Calliope, is a player of Apollo’s favourite instrument, the lyre, and a consummate singer. When his wife, Eurydice, dies, the enchantment of his music charms even the king and queen of the dead, securing her release from the underworld.

Orpheus’s legendary success is short-lived, however, and in the end, Eurydice is lost. He grieves, and in his grief, forswears all other women. As revenge for his refusal, he is torn apart by the Bacchantes, followers of Dionysus. His severed head floats down the river and is discovered, still singing, by a group of nymphs. These different roles of Orpheus have all been confronted by opera theorists and opera makers. Orpheus the mystic, the crosser of boundaries, was the guiding spirit of opera at its inception, and Orpheus the lover and tragic hero is well-considered in philosophical and narrative or literary interpretations of the form. Orpheus the pederast – according to Ovid, he invented the practice – is a sometimes-overlooked manifestation with a resonance that reaches to queer readings of opera.¹¹ Even Orpheus the dismembered has served as an inspiration for Carolyn Abbate, who uses his severed head as a starting point for her investigations into how notions of the uncanny, of (dis)embodiment, and of Cartesian duality all inform and are in turn informed by the study of opera.¹²

The severed head is missing from operatic retellings of the Orpheus myth, and Abbate gives it great prominence precisely because of its exclusion. Adopting this approach, we notice another Orpheus, however, also made conspicuous by his near absence from the opera stage, or at least from the musicological account which has until recently constituted

⁹ Adorno, 1999: 15–28.

¹⁰ Bowra, 1952.

¹¹ Koestenbaum, 1993: 178–79.

¹² Abbate, 2003.

its standard history.¹³ In fact, Abbate and Parker exclude this Orpheus from their account of the myth in their own history of opera: Orpheus the Beast-Tamer, who uses voice and lyre to charm the wild animals, the very forces of nature, into silent submission.¹⁴ The pioneers of opera, ‘driven by a sense of loss and the need to regain an ancient magic,’ were nonetheless well aware that ‘the impulse behind opera created an Edenic dream’¹⁵ which could never be recaptured. Orpheus’s concert among the animals was a perfect manifestation of this Edenic dream. Through his own ancient magic, the magic of the sung word, Orpheus was able to restore a prelapsarian communion with the natural world. Rather than attempt to recreate this peaceable kingdom, however, the form’s earliest popularisers were content to reflect human dominion over the beasts – beasts which are potentially dangerous not only to our bodies but to our notion of ourselves, even/especially as they help define that very notion.¹⁶

From the very outset, opera itself was inextricably linked with a greater project – celebrating the exclusively human potential to transcend nature.¹⁷ Opera is a key feature of this struggle upwards, using the voice to demonstrate the human capacity for accessing the sublime. Yet the ability to make and to appreciate music was dangerously ambiguous territory, where visceral animal expression intersected with the exclusively human faculties of language and reason.

To come face to face with an appreciative crowd of music-loving animals might raise uncomfortable suspicions about the flimsiness of the human-animal boundary. As Alan Sinfield reminds us, ‘the point at which the text falls silent is recognized as the point at which its ideological project is disclosed. What may be discerned there is both necessary and necessarily absent.’¹⁸ Unable either to address or to deny the inconvenient but obvious parallels and connections between human and non-human nature, opera disingenuously avoids one of its figurehead’s defining moments, turning its back on the animal in its quest towards the divine.

In contrast, poets, philosophers, and visual artists of the later Renaissance would find themselves returning countless times to this most persuasive demonstration of the powers of Orpheus – the powers of the human voice, of human music over the natural world, and

¹³ Opera Studies as a discipline seeks to supplant, or at least supplement this account. See Till, 2012.

¹⁴ Abbate and Parker, 2015: 44.

¹⁵ Chua, 2001: 20–21.

¹⁶ See, for example, Ham and Senior, 1996; Midgley, 1994.

¹⁷ I examine opera’s roots in neo-Platonic mysticism and cosmology briefly in my discussion of *Sacculina* in part two. See, for example, Tomlinson, Chua, Voss, *et al.* as well as Mirandola.

¹⁸ Sinfield, 1992: 74.; cf. Macherey, 1978: 95–97.

by implication, the bestial state to which they might otherwise descend.¹⁹ For the Classical Romans, too, with whom they were eager to establish more direct cultural linkages, this image of Orpheus had crowded out all others, with ‘the popularity of the theme [...] only



Figure 3: Orfeo e gli animali
Sinibaldo Scorza, oil on canvas, 120x160cm.

matched by the diversity of its treatment.’²⁰

For painters like Sinibaldo Scorza (1589-1631), who painted at least nine still-extant depictions of that archetypal concert, Orpheus proved as irresistible a subject as for the opera composers who would claim him as their own. Scorza’s Orpheus, however, was mere narrative pretext for the abundant variety of animals that surrounded him. The painter’s preferred subjects are scenes which, like his Orpheus paintings, demand the presence of a multitude of animals, revealing an irresistible naturalistic impulse.²¹

This inclination would have to wait until the twentieth century to be named. Entomologist E. O. Wilson called it ‘biophilia’, and further proposed that delight in the natural world is

¹⁹ See Scavizzi, 1985.

²⁰ Harrison, 1962: 13.

²¹ Guelfi, [n.d.].

an essential characteristic of our species.²² For Howard Gardner, Scorza's apparent biophilia is evidence of a 'naturalistic intelligence' that ranks aside the visual or the kinaesthetic as a way of approaching and understanding the world.²³ Nor is this retrospective diagnosis of biophilia incompatible with the humanist Renaissance world-view. 'Humanity is exalted not because we are so far above other living creatures,' Wilson tells us, 'but because knowing them well elevates the very concept of life.'²⁴

Wilson may adopt a significantly less anthropocentric position than the early humanists, reflecting intervening paradigm shifts in cosmology, but the exaltation of humanity is not in question. His sentiment ultimately demonstrates continuity with the ideological programme of the creators of those earliest operas. Given the fundamental importance of that audience of subdued animals, both to the figure of Orpheus himself as well as to the humanist ideal he represented, we might reasonably expect the early producers of opera to have seized upon this episode as the ideal moment to recreate through their newly-invented form.



Figure 4: Cosimo I de' Medici as Orpheus, Agnolo Bronzino, c. 1538-40.

Bronzino's striking 1537 portrait of the young Cosimo I de' Medici as Orpheus shows how natural a part of the symbolic vocabulary of the Renaissance Orpheus had become.²⁵ His talents lay beyond the merely musical. He had taken on a richness and flexibility of meaning that makes him stand out against all the other Greek mythical heroes, religious teachers, philosophers, and poets who play such an essential part in the thought and art of the fifteenth and sixteenth centuries.²⁶ For the informed viewer, the Bronzino image attributes to the teenage First Duke of Florence a whole range of spiritual powers, even as it links the figure of Orpheus to the Duke's own

²² George Boas's 1933 coinage of 'theriophily' did not have similar impact. Boas, 1966.

²³ Gardner, 2000: 48–52.

²⁴ Wilson, 2003: 22.

²⁵ Simon, 1985: 18.

²⁶ Walker, 1953.

material and political power. The dog and the *lira di braccio* are both necessary and sufficient to identify the subject as Orpheus, and thus Bronzino has also identified the indispensable elements of opera – a human body (with its concomitant voice), a musical instrument, and a contained animal presence.

1.1 *The dogs are missing (My God!)*²⁷

The Orpheus myth was unsurprisingly one of the most important subjects of seventeenth-century opera,²⁸ and as Mladen Dolar confirms, the charmed animals that attend him are ‘an essential part of Orpheus iconography.’²⁹ In fact, closer investigation of these early Orpheuses leads to a much less decisive conclusion than Dolar’s, a search for the animals in these operas turning up only the faintest of traces. The power of music over nature is just as often characterised as an ability to move rocks and trees as to charm the beasts. While this idea arguably owes itself to Ovid, whose Orpheus moves, along with unnamed ‘beasts’, a comprehensive catalogue of tree species, to attribute the near absence of animals to the source material ignores the ways in which the myth is already subject to the manipulations of its many adapters, each according to their particular aesthetic or dramatic agenda.

Poliziano’s *L’Orfeo* of 1481, a landmark in the development of the form, both in its contemporary influence and as a touchstone for opera historians, sets the tone for subsequent adaptations. This proto-opera focusses almost exclusively on Orpheus’s grief over the second, permanent loss of his wife. Though this is the very lament the classical Orpheus sings in the wilderness to an audience of animals, in opera they are easily dispensed with. In Domenico Belli’s 1616 *Orfeo Dolente*, for example, the charmed beasts are specifically replaced with a chorus of shepherds. Landi remains more faithful to the original in what is an otherwise radical departure from the classical Orpheus, beginning his opera (*La Morte d’Orfeo*, 1619) after the second loss of Eurydice. Having decided to cheer himself out of his grief by throwing a birthday party for himself and inviting various demigods and Olympians, Orfeo opens the second act by addressing all of nature, not in a lament, but a celebration of life, music, and himself. Here, the animals are tucked away in a litany of natural wonders, from the ‘bearded stars’ of the first verse to the ‘lovely splendours of the sun’ in the last. His solo begins with a command to the heavenly objects, oceans, hills and valleys to rejoice at his birth, taking the concrete, fantastical literalism of

²⁷ Harrison Birtwistle’s reaction to discovering that Cerberus had been written out of the libretto for *The Mask of Orpheus*. Beard, 2008.

²⁸ Buller and Sternfeld offer two slightly different lists of such operas, of 12 and 20 works, respectively. (Buller, 1995; Sternfeld, 1988.) The trend continues to the 20th century – see Cross, 2009.

²⁹ Žižek and Dolar, 2002: 9.

the classical sources into the realms of the merely metaphorical. His commands are not meant to be followed, but simply reflect his own exuberant joy. In this context, we no more expect the animals actually to ‘dance through the forests, through tangled woods and open meadows’ than we do the ‘ever-changing mass of salty waves and liquid crystals [to] rejoice,’ or the waves and trees to sing. (Unfortunately, though tellingly, no record of any contemporary performance of the work exists, a significant lacuna leaving us to guess how the elaborate stagecraft of the period may have been put to the service of representing these preternatural wonders.)³⁰ Peri and Rinuccini adopt a similar approach in their own *Euridice*, in which animals, plants and forces of nature are all said respond to Orpheus’s music (or in joy to his upcoming wedding to Euridice), but animals are merely referred to as metonymic of nature as a whole, and these joys and sorrows occur only as off-stage events.³¹

It is not until scene twelve of the mid-century Rossi/Buti *Orfeo* that the primal Orphean scene is at last unambiguously re-enacted. Nonetheless, this first opera written specifically for performance in France in 1647 presents a version of the myth so highly embellished as to be nearly unrecognisable. Ellen Rosand notes that in Rossi’s *Orfeo*, even the hero himself ‘was dwarfed by a mixture of pressures imposed by the traditions of French court entertainment on the one hand, and by the conventions of Italian opera on the other.’³² The otherwise remarkable dance of the trees and animals is lost amongst the many theatrical extravagances that typify this Orpheus, characterised by Henry Prunieres as ‘d’une incohérence et d’une bizarrerie surprenantes,’ an early example of a charge that continues to be levelled at opera itself to this day.³³

The animals seem only slightly more visible in France than in Italy – while entirely absent from Charpentier’s 1686 *Orphée*, four years later, Lully has his Orpheus not merely enchanting, but at last specifically addressing the beasts. Their charmed silence, however, is recast as a typically beastly unruliness – they do not heed his plea to devour him.³⁴ Even the hints of the animal in these operas have been largely lost to opera audiences, as it is Monteverdi and Striggio’s *Orfeo* that towers over them in the modern repertoire. In addition, opera history has conventionally taken scores and libretti as the objects of record, disregarding the visual and performative aspects of the works, inherently ephemeral, as mere historical by-products.

³⁰ Landi, 1999.

³¹ Peri, 1981.

³² Rosand, 1983: xvi.

³³ quoted in Rosand, p. xvi

³⁴ Lully, 1690.

The prologue to *Orfeo*, sung by the allegorical figure of Music herself, acknowledges the centrality of the charmed animals, identifying the protagonist first and foremost by recalling his miraculous concert.³⁵ For Monteverdi and Striggio, the triumph over the animal is so fundamental to Orpheus's magic that it needs no staging. Instead of confronting the species divide, Monteverdi's Orpheus has his sights set on less ambiguous, though equally daunting, borders – between life and death, between god and man, between mortality and immortality – crossings of which figure prominently in the Orphic (and therefore the operatic) myth.

In Peri and Rinuccini's *Euridice*, the relative insignificance of Orpheus's animal magic is made explicit. Aminta, congratulating him on his successful retrieval of Euridice from the land of the dead, makes brief mention of his power over nature before adding that 'today we admire an even nobler triumph of your famous lyre, for you have won an immortal prize, moving the gods in heaven, making hell itself submit.'³⁶

A certain sensitivity to the audience may also have played its part in discouraging composers from recreating this iconic performance. Spectators enraptured (one hopes) by the song of a reimagined Orpheus might feel distinctly insulted to notice the analogy between themselves, the (real) human audience, and the (represented) audience of 'dumb beasts'. The exposure of such parallels undermines not merely human status, but human difference – the gap between human and non-human is rendered perilously unclear.

Humankind was becoming an increasingly precarious category, complicated by an era of exploration that found the globe populated by marginal, seemingly half-human forms. It was no longer clear where the human-animal boundary lay, or indeed who or what lay on either side – confusion over whether apes and other simians were human or not extended to newly-discovered "primitive" peoples. Pygmies, orangutans, atheists, chimpanzees, and feral children were all subject to the same taxonomic bewilderment.³⁷

A contemporary best-seller, Topsell's *History of Four-Footed Beasts*, underlines some of these ambiguities and uncertainties.³⁸ The title asserts a taxonomy based on physical features, but the inclusion of a creature designated 'man-ape' is symptomatic of the problem of defining exactly what features were necessary or sufficient to qualify for the label 'human'.

³⁵ Monteverdi, 1909.

³⁶ Peri, 1981: xxxvi.

³⁷ see Ham and Senior, 1996; Fudge, 2004.

³⁸ Topsell, 1973.

At its very outset, humanism (and thereby opera, its prestigious mouthpiece) was in crisis, unsure how to identify its own central object more robustly than as the ‘not-animal’.



*Figure 5: Diogenes the Cynic with a plucked chicken: ‘Homo Platonis’
Ugo da Carpi, 1520-30, woodcut.*

Definitions of the human that focussed on lacks and absences proved particularly dissatisfying – a biped without feathers is, after all, just a plucked chicken.³⁹ Cynics might mock, but in the earnestly neo-Platonic Renaissance this was no laughing matter. Since that time our human-ness has been variously located in our upright posture, our opposable thumbs, our ability to blush, laugh, or lie, wage war, believe in God, or have recreational sex.⁴⁰ Dramatist Philip Massinger, writing in 1623, reflects the contemporary exasperation at such definitions when his heroine laments that ‘the only blessing that Heaven hath

³⁹ Twenty-five hundred years later, we seem to be faring little better. The notion of ‘becoming animal’ introduced by Deleuze and near-ubiquitous in Animal Studies discourse takes as its central definition a list of those occurrences which becoming-animal is not. His later insistence that all becomings-animal are ‘molecular’ is no more helpful. (see Deleuze and Guattari, 2004: 237–39, 272.) The now-fashionable term “non-human animal” is useful but deceptive in its precision, relying as it does on the same problematic boundary. In a curious, perhaps not-insignificant parallel, “opera” suffers a similar nomenclatural malaise in its relation to other modes of music theatre.

⁴⁰ Provine, 2004: 216; Crozier and de Jong, 2016; Twain, 1973; Hooton, 1954; Tyler, 2006.

bestow'd on us, more than on beasts, Is, that 'tis in our pleasure when to die.'⁴¹

Seemingly betrayed by a scientific conception of the universe that saw man reduced and physically marginalised, and that saw encroachments on human territory from every direction, the early humanists were driven to insist nonetheless that humanity occupied the *metaphysical* centre of creation, a bridge between the divine (ineffable, immaterial, soul) and the animal (earthly, material, corrupt, body) – a philosophical position that found a concrete, creative outlet in the earliest opera.⁴² Humanity was not an innate quality, meaning that a human subject could just as easily slip backwards into beastliness as forwards into the divine, as warned by Pico della Mirandola, in his *Oration on the Dignity of Man*, a text of such influence that it has been called 'the most succinct expression of the mind of the Renaissance' – indeed, the 'manifesto of humanism.'⁴³

1.2 Harmony and dominion: the animal as operatic spectacle

The reluctance of librettists and composers to commit to representing the Orphean concert on stage certainly did not mean a total exclusion of animal performances. In fact, by the end of public opera's first century, animals were such a prominent feature of operatic extravagance as to be a running joke among its critics. One such critic, the composer Benedetto Marcello, provides us with a rare glimpse of early eighteenth-century performance practice. In his satirical instructions to would-be opera producers, *Il Teatro alla Moda* (1721), Marcello advises that 'the librettist should not worry about the ability of the performers, but so much more about whether the impresario has at his disposal a good bear or lion.'⁴⁴

When opera as a public entertainment reached its first flowering in seventeenth-century Venice, the only suitable habitat for an operatic animal was in the *ballo*. This intercalary dance was standard in Venetian opera, and thus became an important influence on European opera as a whole.⁴⁵ Horses, bears, and even ostriches were featured in the *balli*, but as they made no sound, left little trace in the traditional account of opera. Instead, we

⁴¹ Massinger, 1978: l.iii.209-211.

⁴² Tomlinson, 1999.

⁴³ Pico della Mirandola and Kirk, 1956: xiii.

⁴⁴ Marcello, 1948: 373. The opera house's function as a place to indulge the multiply animal pleasures of the bear pit (in ostensibly polite company), is thus exposed, giving lie to its high-culture credentials.

⁴⁵ The body moving to music that is the subject of dance scholarship is, of course, always present in opera performance, but it the so-called 'scandal of the singing body' (Duncan, 2004) that is of central concern here. 'Dancing bears' and 'dancing-as-bears' deserve more detailed attention than I can offer here.

must rely on ‘diaries, newsletters, and chronicles [to] provide tantalizing – but often frustratingly brief – glimpses of opera spectacle’,⁴⁶ for it was as spectacle rather than subject that these animals would take part, not to act but to be acted upon.

The presence of an animal was therefore the presence of a silent body – it might be brought on stage to dance, but never to sing. Contemporary eyewitnesses could marvel at a horse strapped into the stage machinery, a primitive cyborg Pegasus, flying across the stage, or a wild stag driven in a hunt sequence through the auditorium and to its death.⁴⁷ A contemporary reviewer of *La fortuna tra le disgratie* (1688), in which such a hunt scene takes place, was driven to ‘extraordinary admiration and the necessity to confess that the Venetians even make wild animals adapt to the stage.’⁴⁸

There is no suggestion that these animals have been made docile through the magic of music. Quite the contrary – animal trainers have long recognised that ‘the habit of obedience is quite a different thing from docility.’⁴⁹ The animal, as silenced, unwilling participant in operatic spectacle, offered a practical demonstration that if we could not recapture the magic of Orpheus through song, his achievements might be duplicated by other, less metaphysical means. But the necessity of brute force or mechanical intervention to ensure an illusion of interspecies co-operation exposes the lie behind the great Orphean fantasy.

By the time the opera had become an essential fixture of London’s elite social scene, the whole notion of Orphean magic had been downgraded from object of mystery to object of ridicule, as evidenced by Joseph Addison’s tongue-in-cheek account of the 1711 production of Francesco Mancini’s *Hydaspes*:

THERE is nothing that of late Years has afforded Matter of greater Amusement to the town than Signior Nicolini’s Combat with a Lion in the *Hay-Market* [...] Many likewise were the Conjectures of the Treatment which this lion was to meet with from the hands of Signior Nicolini; some suppos’d that he was to subdue him in *Recitatevo*, as Orpheus used to serve the wild beasts in his time, and afterwards to knock him on the head;⁵⁰

Musical enchantment proved less effective than the use of fear and violence in keeping on-

⁴⁶ Alm, 2003: 218.

⁴⁷ Alm, 2003: 245.

⁴⁸ *ibid.* 245, note 96.

⁴⁹ S, 1901: 116.

⁵⁰ *Spectator XIII*, 15 March, 1711.

stage animals from disrupting the performance. They are reduced to the status of objects, subjugated, stripped of dignity, or even killed.⁵¹ These animals pay a high price for what amounts to a negligible contribution to the drama, appearing in scenes of grand but gratuitous spectacle. The dances they take part in, however, offer confirmation of opera's wider cultural assumptions. The animal-as-spectacle exhibits in its most refined form the same idealised relationship between the human and the non-human, that of 'harmony and dominion', which Erica Fudge identifies as central to the production not only of opera but of meat.⁵² If the analogy at first seems far-fetched, it may be that the other essential contribution of animal bodies to the opera performance is so easily overlooked. Orpheus's lyre was fashioned from a turtle shell and strung with a sheep's cured intestines. Their corpses repurposed as instruments, these animals relied on a human touch to restore their voice.⁵³

1.3 Performing (as) bears on the opera stage

The seventeenth-century bear, unlike the bears of today, was neither cuddly, endangered, nor rarely encountered. With their upright posture, omnivorous diet, and inscrutable though obvious intelligence, bears were too close to human to be considered anything but grotesque, one of those animals like apes 'who become more ugly the nearer they approach in their resemblance to man.'⁵⁴

Its fearsome appearance and physical strength made the bear a useful creature with which to demonstrate the mastery over nature that set humans apart from other species. Although the frisson provided by the prospect of dangerous, even lethal failure was an indispensable attraction of the carnivore's performance, the submission of the animal to the rigours of the drama was never truly in question. The staged battle between man and beast, whether portrayed as hunt, ballet, or hand-to-hand combat, could only result in human victory.

To allow otherwise would compromise the very foundations of Enlightenment humanism. Because the bear and human bodies pitted against one another in such contests were so

⁵¹ Alm, 2003, p. 245, note 96: "'That which astonished the most was a real hunt of live deer, bears, and wild boars, that were killed by the hunters.'" *Mercure galant* (February 1681)'

⁵² Fudge, 2004: 70.

⁵³ M. Ferrein would take this to an extreme with his musical experiments on the dissected vocal tracts of various mammals, including humans. See Rees, 1819: 311.

⁵⁴ from 'An Extraordinary Freak of Nature,' broadside in the John Johnson Collection, *Human Freaks* 1, in Ritvo, 1997: 145. Shakespeare's Helena can express her own self-loathing no more forcefully than 'No, no, I am as ugly as a bear, For beasts that meet me run away for fear.' The disquiet or revulsion caused by such near-imitations of the human has resurfaced among the builders of humanlike robots, who term the dip in attractiveness the 'Uncanny Valley'. See Mori, 2012.

hopelessly mismatched, human victory provided evidence that the weaknesses and deficiencies of the human body were in fact irrelevant. Animal trainers make this explicit – ‘Every performance is a genuine victory. It is the triumph of the trainer’s will over that of the animal.’⁵⁵ Whip and chair – prosthetic weapons in a fight against an animal that had most likely been stripped of its own teeth and claws – are carefully ignored. The defeat of the brute by the ostensibly unarmed human underlined human difference, confirmed human superiority, and located both in the mind.

Indeed, such displays of power were not merely a symptom of the human condition, but a measure of its progress: ‘That man is the lord of creation is generally understood, [and] there can be no doubt that in the future man’s mastery over the brute creation will be even more strikingly manifested.’⁵⁶ While the wild bear of Europe was not a significant danger to humans (quite the reverse),⁵⁷ a captive bear had a role to play as stand-in for all of brute creation, and was forced to live up to its reputation for ferocity. The performing bear was chained, beaten, starved, enraged, or made to defend itself against the attacks of dogs, domesticated into savagery by their human masters.⁵⁸ These performances reinforced such power relations as reflections of inherent cosmic order rather than malleable social constructs. These rigid stratifications assigned all of creation a place in a single hierarchical structure that was recreated in microcosm on the opera stage. This depiction of a dance of chained bears led by Turks provides a striking demonstration of recursive dominion re-enacted through performance.

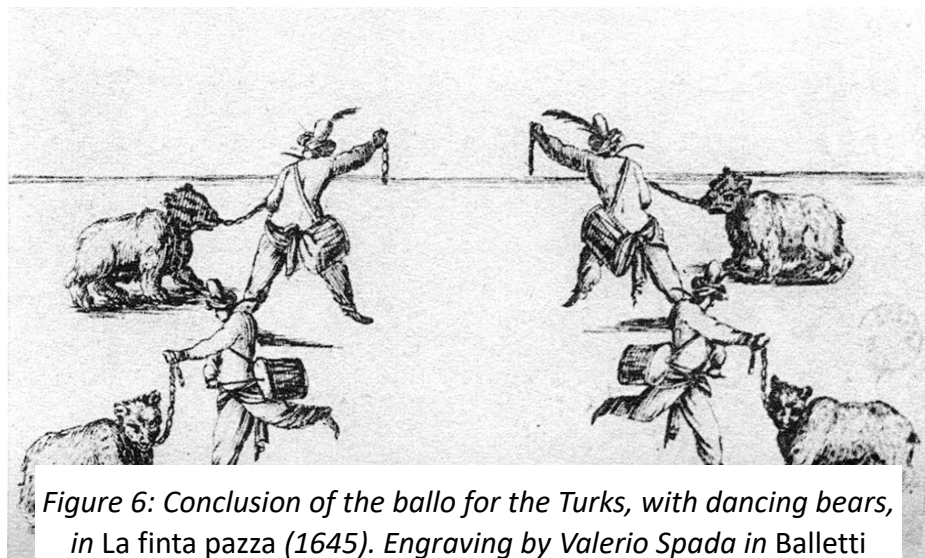


Figure 6: Conclusion of the ballo for the Turks, with dancing bears, in *La finta pazza* (1645). Engraving by Valerio Spada in *Balletti d’invenzione nella Finta Piazza di Giovanbattista Balbi*, ca 1658.

⁵⁵ S, 1901: 116.

⁵⁶ S, 1901: 119.

⁵⁷ Steyaert and others, 2016; Brunner, 2007.

⁵⁸ Brunner, 2007.

In addition to bears, live elephants and camels were known to have appeared on the stages of Venice,⁵⁹ and in London, the prospect of a live lion in *Hydaspes* was so plausible that ‘upon the first Rumour of this intended Combat, it was confidently affirmed that there would be a tame Lion sent from the *Tower* every Opera Night.’⁶⁰

However, the presence of any live animal in the theatre, particularly such a potentially dangerous predator, is a notorious theatrical problem, causing nothing but expense and inconvenience to the producer. As Nick Ridout points out, however, it is precisely the expense and inconvenience that make the animal act an attractive prospect.⁶¹ The *ballo* after the first act of Francesco Cavalli’s *La Calisto*, in which six bears emerge from the forest and dance, may have been an extravagance too far, even for such a seasoned impresario as its producer Mario Faustino – a line in the account books for *Calisto* records payment made not for bears themselves, but for bear costumes.⁶² Audiences would not have been disappointed, however. The bear Marcello repeatedly cites as integral to the successful opera production is later revealed to be a human performer himself, possibly the theatre janitor, who ‘should also play the part of the bear gratis, if necessary.’⁶³ Nor would such an ersatz bear fail to demonstrate human mastery over the natural world – those bearskin costumes were trophies taken from even more comprehensively conquered beasts.

Whatever practical concerns may have been resolved by the use of human actors, these performances-as-animal invited other problems. There was a fear that boys or women playing animal roles were in danger of becoming animals themselves, as their hold on humanity was less secure than that of men.⁶⁴ Long-standing Christian tradition, too, made clear that a human being taking on the guise of an animal put his immortal soul at risk. From St. Theodore’s *Liber Poenitentialia*, the first recorded laws against witchcraft, to William Prynne’s *Histrion-mastix*, a comprehensively annotated Puritan rant against the theatre,⁶⁵ authorities were explicit about the unholiness of such practices.

Despite the twin threats to the performer-as-animal, the risks both spiritual and ontological, the practice continued. The hotly-anticipated lions in *Hydaspes* would turn out to be played

⁵⁹ Alm, 2003.

⁶⁰ ‘Untitled Item (Spectator)’ 1711.

⁶¹ Ridout, 2006: 105.

⁶² Alm, 2003: 244, note 90.

⁶³ Marcello mentions the bear no fewer than thirty times, often in conjunction with the earthquake, the lightning, the prima donna, and similar extravagances.

⁶⁴ Knowles, 2004: 139.

⁶⁵ Prynne, 1633; Summers, 1956.

by human performers in lions' skins, though they would have done well to heed the warnings. Of the first actor to play the role, 'it was observ'd of him, that he grew more surly every time he came out of the Lion,' unable to shed the lion's temperament as easily as he did its skin. He demonstrates his beastliness, too, by refusing to submit to the rules of the drama, breaking the mimetic spell as he 'would not suffer himself to be killed so easily as he ought to have done.' Altogether too lionish, the authentic animality of his performance makes him unsuitable for the stage.⁶⁶

1.4 *The Great Bear*

The title character of *La Calisto* undergoes a more extreme involuntary transformation. She is best known to modern audiences by the adoptive Roman name of the form she took after her apotheosis, for she became Ursa Major, the Great Bear who dominates the summer skies. The opera (composed by Monteverdi's student Francesco Cavalli to a libretto by Cavalli's long-time partner Mario Faustino) is replete with collisions and crossings-over between the human and natural world. The setting is a post-apocalyptic Arcadia just devastated by Phaethon's fire, a world in which the trees have gone, the ground still smokes, and from which the animals have fled.⁶⁷

The story of Phaethon is a cautionary tale of human hubris with disastrous environmental consequences, and Jove's reaction to the destruction of the world would not seem out of place in a modern environmental campaign.

As yet the lower Hemisphere is seething with vapour,
for still it is burning; Earth with languishing cries from
its thousand, thousand mouths, begs in its fiery fever
help from high Heaven. And so 'tis our bounden duty,
as we are guardians of the world and all its creatures,
now to save mankind from fire and drought and
recompense great Nature.⁶⁸

His seeming eco-awareness does not translate into a general biophilia, nor does the duty he expresses to the goddess Nature truly extend to 'the world and all its creatures'. When his advances are rejected by the nymph Calisto, he takes a more unambiguously modern position regarding the relative value of the non-human, chastising Calisto and her

⁶⁶ 'Untitled Item (Spectator)' 1711.

⁶⁷ Phaethon, tormented by his peers over his doubtful parentage, sets out to prove that he is truly a child of Phoebus. Bound by a rash oath, his father reluctantly grants Phaethon's wish and allows him to drive the sun chariot across the sky. Unable to control the supernatural animals powering his celestial vehicle, he veers wildly off course, setting the earth ablaze before Jupiter is forced to dispatch him with a thunderbolt to avert further climatic chaos. (*Metamorphoses* II, 1-328)

⁶⁸ Cavalli and Faustino, [n.d.]: I, i.

companions for ‘losing [their] humanity in the company of beasts.’

Not all the beasts in question are, in fact, entirely animal – at least not from the waist up. Pan, Silvano, and Satirino are satyrs, Dionysian forms of the first order. Cosmologically wedged between apes and angels, they are in one respect no different from the humans in the audience. Yet while the spectators would have been well aware of their own ever-present animal natures, they would also consider such natures to manifest themselves only as the result of spiritual or moral failings.⁶⁹ Despite being a pastoral idyll, the opera reflects the urban culture in which it is embedded, and the animal both literal and metaphorical is repeatedly invoked as repulsive, a sign of uncontrolled lust. Satirino’s relatively tame romantic advances are rejected by the nymph Linfeo for his all-too-apparent wild animality. His objections that his ‘origins are half-divine and noble’ only focus attention on that other, hairy half, and Linfea repudiates him by declaring he belongs among the goats.

It is a charge that young Satirino is quick to deny. Though the *verso sdrucchiolo* in which he sings marks him out as uncivilised and rustic as much as his cloven hooves,⁷⁰ he throws the accusation back at the pompous, prudish Linfea: ‘Your birth was surely among the asses, or some similar parents. I know why your greedy libido rejects me... because the tail I bear is still dainty and growing.’⁷¹

Not to be outdone, Linfea has the last word, telling him to ‘take his love to the flocks.’ Her anti-animal attitude is unequivocal, reinforcing an essential separation between human and nature. This comic argument in fact reveals serious ambivalence over the moral position of the Early Modern animal. Satirino’s hybrid body is indicative of both Arcadian freedoms and irrefutable shame.

Though not exactly human herself, the nymph Calisto is beyond such reproach, her chastity consecrated to the virgin huntress Diana, with an innocence reflected in her physical beauty. When Jove conjures up a miraculous fountain in an effort to seduce her, she is filled with wonder but easily resists his advances. For her, the natural world, the company of animals is a refuge from the social structures that might otherwise keep her subjugated to men. Her state of nature is a state of Edenic grace – she sleeps on beds of flowers, nourishes herself with honey and river water. Indeed, the very melodies she sings she claims to have learnt from birds. Despite her human shape, however, her internal animality is made musically explicit in the extravagant melismas that extend the word

⁶⁹ Midgley, 1994: 37-39.

⁷⁰ Rosand, 2007: 344-45.

⁷¹ Cavalli and Faustino, [n.d.]: I, xiii.

liberté, echoed by the violins in the ritornello. These uncouple the sound from semantic meaning, from the humanness of language, to expose the animal nature of both song and singer.⁷²

This animal innocence is easily exploited by Jove, however, who seduces her in the guise of her patroness. Tellingly, although in Ovid's version she is clearly a victim of rape, in the opera, 'Calisto is scarcely a silent or resisting participant' and she cannot contain her delight over her new-found sexual pleasures.⁷³ Though blameless, deceived by a god, in this momentary surrender to the animal she has lost the privilege of humanity. Unlike the satyrs, she cannot permanently inhabit that liminal space between human and Other, and Juno in her vengeance condemns her to taking on the body of a bear. She who was once Calisto, literally 'the fairest', is turned into an animal who was a byword for ugliness and savagery. Crucially, however, this is a transformation seen, but not heard. At this most quintessentially operatic moment, the moment of her greatest tragedy, we cannot hear Calisto's lament.

The animals that surround Orpheus, if they appear at all, remain rapturously, blissfully silent. Calisto, on the other hand, is violently devoiced, and her silence denies the audience the unhindered access to her internal world which is particular to opera. We might dismiss the notion of Calisto's soprano voice emerging from the body of a bear as preposterous,⁷⁴ but why, among the innumerable other absurdities inherent to opera, has the singing beast been so resisted? And what might happen if that unspoken prohibition were to be lifted? Though operatic magic might easily allow her to sing, to ask an audience to identify with the bear, even as Calisto lamenting her new bear's body, would demand too radical a departure from the revulsion required in such a confrontation with the animal Other.

Calisto is thus unpersoned through her imprisonment in a non-human body. Although her continued experience of self through both transformations implies a subjectivity that endures her metamorphosis, the silence required of her animal body precludes her from asserting her selfhood by the operatic means of the sung word.⁷⁵ To grant a non-human body this symbolic subjectivity, this moral personhood, would be a perversion of opera's

⁷² I, iv, mm 85-90. See chapter two for a fuller discussion of the relation between the speech-song and human-animal continua.

⁷³ Rosand, 2007: 344.

⁷⁴ The imagined sight of the singing beast itself was the most ridiculous of all the explanations for *Hydaspes*' lion: 'the Lion was to act a Part in High-Dutch, and roar twice or thrice to a thorough Base, before he fell at the feet of Hydaspes.' 'Untitled Item (Spectator)' 1711.

⁷⁵ As Sandra Corse notes, as the body is the signifier of subjectivity in the theatre, in opera it is the voice. (Corse, 2000.)

metaphysical purpose. It is the loss of her voice that marks Calisto's exclusion from humanity, and the performative voice of Jove that restores her to it.

As a bear, Calisto's selfhood is not merely concealed, but made inexpressible and therefore entirely lost. Her silence through animalisation is akin to another death from which she, like Eurydice, miraculously returns. Released from her unbearable ursine condition, she exclaims, 'Io mi rinnovo formo voci, e parole riumanata!' ⁷⁶ It is not her human body that she celebrates, but the restoration of her voice, the rehumanising force of language. Her first word, 'io', is at once a cry of joy and a reassertion of her subjectivity. ⁷⁷ Such celebrations are premature, however, for Juno's words cannot be unspoken, nor their power revoked. Jove has merely brought Calisto back to offer her the consolation of a place among the stars, as promised in the prologue by Destiny and Eternity. Immortalised though she may be, her apotheosis is ambiguous and her gratitude misplaced. She is blessed with an eternity in her accursed animal form. ⁷⁸



Figure 7: *The Great Bear*, from *Urania's Mirror*, by Jehoshaphat Aspin, 1825.

The myth of Calisto's punishment in its operatic recreation reflects an Early Modern understanding of the animal as not a natural, but a moral category. The consequences of her transformation confirm the embodied voice as the ultimate locus of human subjectivity. The engagements with animality in *La Calisto* reaffirm what the animal erases in the early Orpheuses only hint at – a biophobia symptomatic, even definitive of the modern world.

⁷⁶ I have regained my voice, and my speech is human again. (my translation)

⁷⁷ io = in Italian, 'I'; in Latin, 'Hurrah'

⁷⁸ Though the constellation's name dates from Classical times, Galileo would also give the name Calisto to one of the four moons he discovered orbiting the planet Jupiter in 1610.

Chapter 2: A Theatre of Wonder in the Age of Reason

Although it is debatable whether the progressive demystification of nature that characterised the years following the scientific revolution constitutes a genuine Enlightenment, one can hardly blame the 18th-century European for seeing evidence all around that humankind was set apart from – and above – the natural world. The mysteries of creation were no longer simply to be marvelled at, but explained, ideally harnessed for the benefit of the species that sat at its pinnacle.

Where natural order could not be found, it was imposed. The very title of Carl Linnaeus' 1758 *Systema Naturae* exposes the assumptions and ambitions of the era. Projects from David Hume's *A Treatise of Human Nature* (1739) to Jérôme Lalande's *Histoire Céleste Française* (1801), Roget's *Thesaurus* (1805), and Luke Howard's *Essay on the Modification of Clouds* (1803) are testament to the limitless scope of the rationalising impulse, the classifying mind – words, stars, clouds, and passions were all categorised and defined. To define meant literally to create borders,⁷⁹ and the elimination of messy liminalities became imperative. To do otherwise would be to concede limits to the human ability to fulfil its destiny and uncover the order in the universe.

Unsurprisingly, hostility towards the unruliness of untamed nature was fashionable throughout the age of reason, and the urban world of opera was particularly susceptible to such attitudes. Metastasio, among the most influential of those reformers who found opera too exuberant – too wild – warned superstar castrato Farinelli about the dangers of countryside air, telling him that 'the air of paved cities is much less impregnated with this poison.'⁸⁰

Poisonous though it might be, nature was not entirely to be shunned. The 'natural' stood in opposition not only to the products of civilised humanity, but to the unnatural and the supernatural. Disenchantment, a defining feature of Enlightenment, demanded the stamping out of the secular supernatural in all its guises.

Inconveniently, opera, the most popular and prestigious art-form of the day, seemed to present a direct challenge to the ideological and aesthetic programme of Enlightenment. It was an affront to reason. In an era typified by the systematic application of rational thought as a tool for understanding, opera performance demanded an explanation that it

⁷⁹ from Latin *de-* "completely" + *finire* "to bound, limit"

⁸⁰ Hertz, 1991.

stubbornly defied. Even the Diderot/d'Alembert *Encyclopédie* of 1751, could make no sense of it:

An opera is, as far as its dramatic element is concerned, the representation of a marvelous action. It is the divine of the epic rendered as spectacle. Since the actors are gods or heroes and demigods, they must announce themselves to mortals by actions, a language, by an inflexion of the voice that surpasses the laws of ordinary verisimilitude. Their actions resemble wonders.⁸¹

The experience of wonder, based as it is on an attitude of unknowing, was seen as just another brand of superstition by some of the most influential figures of the age. To Bacon, wonder is 'broken knowledge' that must be repaired through scientific enquiry. It is the response of a naïve mind, he says, for no man can 'maruaile at the play of Puppets, that goeth behinde the curtaine, and aduiseth well of the Motion.'⁸²

Adam Smith terms it an 'uncertain and anxious curiosity' brought about by some object's resistance to classification, and follows Bacon by asking, 'Who wonders at the machinery of the opera-house who has once been admitted behind the scenes?'⁸³ The use of theatrical metaphors is no mere coincidence. Through the word *merveilleux*, opera's stage machinery had become literally synonymous with the experience of wonder.⁸⁴ A sentiment that had at one time been a response to the mystery and grandeur of nature was now inspired by products of human design.

Descartes warned against wonder in excess or directed at an undeserving object, an inappropriate wonder (*étonnement*) that he distinguished from the wonder (*admiration*) he identifies as the first passion.⁸⁵ Seeing wonder as the necessary but temporary starting point for rational enquiry (which would inevitably lead to truth), he supplies a causal explanation both to free the opera audience of their unknowing and to belittle those who would not be free. In *The Search for Truth* he writes:

After causing you to wonder at the most powerful machines, the most unusual automaton, the most impressive illusions, and the most subtle tricks that human ingenuity can devise, I shall reveal to you the secrets behind them, which are so simple and

⁸¹ Jaucourt, 1795.

⁸² Bacon, 1605: 49.

⁸³ Smith, 1795.

⁸⁴ Cuillé, 2011.

⁸⁵ This distinction parallels a distinction drawn by many commentators on wonder, from Aquinas (*stupor/admiratio*) to Kant (*Bewunderung/Verwunderung*) see Hepburn, 1984.

straightforward that you will no longer have reason to wonder at anything made by the hands of men.⁸⁶

Descartes' objection is not to the representation of magic, but to the experience of magic, or more precisely, to the sustained attitude of simultaneous recognition and unknowing that is the essence of the experience of wonder. Enlightened spectatorship meant adopting the ultra-sceptical Cartesian approach, in which everything could be known, or the more subtle approach⁸⁷ which eliminated the moment of unrecognition, the postmodern epistemology of hyperknowingness, in which nothing is new, the world entirely-always-already familiar.

Audiences hungry for amazement were not limited to the supernatural spectacle of opera – new sources of amazement were constantly appearing. Gaslight, bifocals, oxygen, the hot air balloon....The Age of Reason was offering evidence of a phenomenon codified in the 20th Century as Clarke's Third Law: 'Any sufficiently advanced technology is indistinguishable from magic.'⁸⁸ Witnesses to the seemingly endless magic that science could produce had already started falling prey to the 3rd Law's fallacious converse, that any magic is the result of advanced technology, and that an experience of magic was a result of insufficient advancement. Audiences did not, however, want the inner workings of opera's universe revealed, but preferred seating that blocked the wonder-destroying view of backstage.⁸⁹

Opera reforms did not succeed in removing wonder from the stage, in either sense. Gluck's continued use of supernatural subjects and machines to represent them were no threat to Enlightenment. Rather, the conflation of machines and magic made possible by technological advance and reinforced by their association on the opera stage made such reforms irrelevant. Because the operation of machines could intrinsically have its causal mechanisms explained, the experience of wonder, Enlightenment's real target, had already been driven out. If audiences did continue to experience wonder, it could be dismissed as *étonnement* or, as Aquinas termed it, *stupor*.

The elimination of wonder from opera spectatorship made opera an accomplice rather

⁸⁶ in Reilly, 2011: 61.

⁸⁷ adopted by Rousseau, Cochin, and Algarotti, among others. Rousseau, too, sought to eliminate the anti-Enlightenment effects of opera magic, though instead of Descartes' push for scepticism in the audience, he prefers the producers of opera to avoid representations of magic altogether, in a choice of plausible, mundane subjects. See, for example, the letter to Diderot 'on Spectacle'; Cuillé, 2011: 70–72; Charlton, 2012: 161–78.

⁸⁸ Clarke, 1962.

⁸⁹ Cuillé, 2011: 71.

than an opponent of the disenchantment of the world at large. Yet the potential for opera to be part of the immanent critique remained, if not in the subjects it represented, then by the form itself. Opera was an affront to reason. The author of *Touchstone*⁹⁰ offers this in the form's defence:

It has ever been granted by those who allow an Opera any existence at all, that things wholly super-natural and marvellous are warrantable in this Kind of Damma; though they would be damn'd in a regular Tragedy or Comedy: An Opera may be call'd the Tyrant of the Stage; it is subject to no poetical Laws, [...] and all this unbounded Freedom is taken for the Probable, or rather what is necessary in this Entertainment.⁹¹

Opera was a natural place for wonders, but genuine wonder provoked by the natural world was gradually displaced by wonder at its imitations, a shift from wonder to mere astonishment. This is also a shift from opera's roots in Platonism and magic. However, the opera stage remained the most hospitable place for figures that defied borders laid down by Enlightenment: male sopranos, musical machines, and singing bodies, all liminal both/and figures rather than either/or.

The opera house became a parallel of the zoological gardens also springing up around the cities of Europe – spaces where dangerous manifestations of unreason, animal and human, were displayed and contained.⁹² Yet nowhere were the limitations and inconsistencies in Enlightenment laid more bare than on the opera stage. Its identifying object – the singing voice – recalled lingering doubts about the nature of humanity, its borders, and what might lay beyond.

2.1 Mozart's Avian Orpheus

Gluck would announce the success of reform with his enlightened *Orfeo*,⁹³ but Orpheus the magician persisted. Opera would continue to defy Enlightenment, despite the attempts to rescue it from unreason. The figure of Orpheus, as opera's guiding spirit, was recast by Mozart and his librettist Schikaneder as Papageno, veiled behind a disarming cloak of humour. Mozart's own biophilic tendencies confirm a stance that was critical of Enlightenment's insistence on humanity as separate from nature.

⁹⁰ 'A. Primcock' is clearly pseudonymous, and the usual attribution of the work to Ralph James doubtful. See Lowens, 1959.

⁹¹ Primcock, 1728.

⁹² Reid, 2016.

⁹³ See Kerman and Wickert.

That monument of Enlightenment culture, *The Magic Flute*, can be seen as the last gasp of a Renaissance hero.⁹⁴ The story follows a typically Orphic framework – our hero Tamino descends into a kind of underworld and with the help of the magic flute of the title is able to win his bride. More strikingly, the score specifies that ‘he is charming animals’ – a rare explicit representation of that central myth, and one that seems to reflect Enlightenment smugness over humankind’s seemingly unstoppable power over nature.

The first love duet adopts another familiar Orphean theme, that of human perfectibility. The two singers confirm their unity by echoing one another’s lyrics and melodies before culminating in a rousing reiteration of ‘*Mann und Weib, Weib und Mann, Reichen an die Gotter an*’ – Male and female both reach up towards the gods.⁹⁵

Contrary to convention, however, this love duet is sung not by the ostensible hero Tamino. Instead, in one of the opera’s many subversions of essential Orphean imagery, his lover Pamina is joined by his sidekick, Papageno, casting doubt on which of the two is the genuine Orpheus. Tamino, in fact, makes his heroic entrance as a parodic Euridice, pursued by a deadly reptile.

Papageno, by contrast, is first seen playing a flute. What’s more, he is using his music to charm the birds, so for all we know, this is the magic flute of the title. But Papageno is a natural music-maker, and any enchantment that might result from his concert is entirely his own. While Tamino’s musical powers depend on a gift from the supernatural Queen of the Night, in Papageno’s hands, an ordinary flute is just as effective. The rustic/folkloric/pastoral quality of his playing confirms that he is untrained, relying not on magic or artifice, but his own nature.

His musical ability is only one indication of Papageno’s natural state. Decked in feathers, motivated only by animal desires like hunger, tiredness and the need for a mate, Papageno is at once bird and bird-catcher, hunter and quarry. He marks the contentious animal-human boundary in an entirely unmetaphorical way – by sitting astride it, embodying his own animality.

This evident animality calls his humanity into question. In their very first meeting, Papageno repeatedly reasserts his own humanness to Tamino, who remains as sceptical as the audience about the validity of his claims. Papageno may also be trying to convince himself. Brought before the evil magician Sarastro, his greatest fear is that he might be plucked and roasted, betraying his own awareness of an avian nature that goes more than

⁹⁴ Wickert, 1977.

⁹⁵ I.vii

skin deep.

With his physical attributes and name both recalling those of a parrot, not even Papageno's linguistic abilities, usually a reliable indicator of the presence of a human mind, can put his humanity beyond doubt. A proponent of the mechanistic model could argue (following Descartes) that Papageno was not truly speaking, but mindlessly parroting the words of others. Nor is this dubious faculty secure – twice, he loses this semblance of speech, and by extension his own tenuous hold on humanity. When he finally meets his love, the equally birdy Papagena, his rational faculties are overcome, and the two of them can only stutter out 'pa pa pa' over and over again – a confirmation that despite all his protestations, Papageno has prefigured Deleuze by 200 years by actually 'becoming-animal.'⁹⁶

Papageno has not charmed the animals through borrowed magic, like Tamino, or through the mystic privilege of divine parentage, as Orpheus, but by his own innate affinity with them. His triumph over animal nature is reached by embracing and displaying rather than denying it. Nor does he fail in the other great Orphic triumph, the journey to the underworld. Though the quest is Tamino's, Papageno serves as his animal shadow, accompanying him the entire way. He, too, has transgressed the boundary between life and death.

Max Wickert briefly notes some of Papageno's Orphic resonances, even going so far as to notice the strange contradiction of having Tamino play a Dionysian flute while Papageno uses his Apollonian glockenspiel, but emphatically dismisses his own observation, finishing that 'we do not, of course, for a moment take Papageno seriously as an Orphic figure.'⁹⁷

Surely Mozart and Schikaneder know better. Tamino, the traditional Orphean figure, comes across as insipid and forgettable in comparison with the delightful Papageno. His first aria proved so enduringly popular that it was taken for a folksong.⁹⁸ An experienced impresario, Schikaneder wrote the role for himself to play, fully conscious that he was going to steal the show.

⁹⁶ See Deleuze and Guattari, 2004. In Papageno's second silencing, though forbidden by magic to speak, he can nonetheless sing.

⁹⁷ Wickert, 1977. Dolar, too, makes this observation, finding an intentional Dionysian impulse in the work, without seeking to resolve the paradox that he himself gives voice to, remarking that 'it is *essential* that Orpheus accompanies his singing by lyre, placing himself under the auspices of Apollo.' Žižek and Dolar, 2002: 9 note 13, emphasis mine.

⁹⁸ Papageno's guileless embrace of his animal nature also reinforces the impression that his singing belongs to something other than the art-song tradition. Goethe voices this Romantic perspective: 'The special value of so-called folk songs is that their motifs are drawn directly from Nature.' (in Pape, 2005: 361)

Perhaps it is not Papageno himself who we cannot take seriously, but Papageno as Orpheus the beast-tamer, and the world-view he therefore represents: human dominion over the animals from which they are unambiguously distinguished. With his repeated disavowals of an all-too-obvious animal nature, Papageno holds up a mirror to the pomposity of disenchanted humanity. To dismiss him as mere comic sidekick is to succumb to the enlightened folly of ignoring the pervasive animal presence in ourselves.

The exuberance of the opera has caused consternation among its commentators, who are deeply divided as to the quality of the libretto. Spaethling spells out their cause for concern, noting that the libretto contains ‘parts of ancient and parts of modern fairy tales, themes from popular as well as classical literatures; [...] literary symbols and archetypes joined with literary clichés; [...] poetic banalities woven into the loftiest ideas of eighteenth-century Enlightenment.’⁹⁹ In other words, by defying easy categorisation, *The Magic Flute* refuses to conform to the needs of the Enlightenment ‘either-or’. It is strange that a work considered the ‘foundation myth of the Enlightenment that was produced at the moment of its triumph’¹⁰⁰ should take such a contrary stance with regards to some of Enlightenment’s most sacred notions.

Biographers such as Alfred Einstein and Thomas Mann would refuse to accept Mozart’s un-Enlightened fondness for nature, in an attempt to connect his musical creativity with abstract reason, reclaiming his reputation from scholars who allied him with the Romantic.¹⁰¹ However, he is known to have held his pet starling and its musical abilities in very high esteem. He faithfully recorded its slightly out-of-tune rendition of his *Piano Concerto no. 17*, adding accidentals and a fermata so that his transcription would match the bird’s natural version, and follows with the comment ‘Das war Schön!’¹⁰² He even went into a period of deep mourning when it died, enshrining it in the musical canon – in a piece he called ‘*A Musical Joke*’.¹⁰³ Again, it is Mozart and his starling who are the tellers of the joke, and music itself, with its humourless claims to reason, that is the object of ridicule. Mozart’s biophilic tendencies offer compelling evidence of a deeper disinclination to cooperate with the Enlightenment project, an alliance with its immanent critique.

2.2 Bird Machines

Mozart’s starling did not stumble upon the tune by accident. Bird-sellers would employ

⁹⁹ Spaethling, 1975: 46.

¹⁰⁰ Žižek and Dolar, 2002: 11.

¹⁰¹ Hertz, 1991.

¹⁰² *ibid*: 114.

¹⁰³ For an ornithological perspective, see West and King, 1990.

boys to whistle tunes to their birds to increase their market value.¹⁰⁴ Lacking a bird with the right repertoire, one could use a bird-organ, or serinette – a device used in the training of songbirds to learn human music.



Figure 8: Above, *La Serinette*, by Jean-Baptiste Chardin.

Right, A serinette, Museum for Musical Instruments, Leipzig



The serinette helps restore our primacy among music-makers, rising above mere nature, teaching the birds themselves to sing. Still, while in one sense the bird is reduced to mere recording device, beneath this instrumentalism lies an acknowledgement that birds do it better – it is not the music of the bird-organ that gives us pleasure, but the music, however artificially imposed, of the actual bird.

In *Siegfried*, Wagner found his own desire to capture the magic of birdsong at odds with his quest for a totally immersive experience. Transparency of medium is made impossible by the challenges in representing non-human bodies and voices on the stage. The shifting strategies of representation make it impossible not to notice the seams.

The role of the Woodbird is shared by a human singer and a collection of musical instruments. In the paradigmatic 1976 Bayreuth production, the Woodbird is subject to a triple representation – unable to substitute the inelegant, over-large human body for the

¹⁰⁴ Frikell, 1876: 326. Frikell comments, 'When a bullfinch has learned to sing two or three tunes, he is worth from five to ten pounds. Few teachers can have the time to give children under their charge so much care as these bird-teachers give their bird-pupils.'

gravity-defying bird, designers rely on the sad and improbable spectacle of a bird in a cage.¹⁰⁵ The bird is not caged as a beast might be, because we fear it, but because we know that given a chance it would fly away, beyond our reach, as did the (in)famously uncooperative sparrows at the 1711 London premiere of Handel's *Rinaldo*.¹⁰⁶ Nor could the birds on stage be relied upon even to sing. Instead, in both *Siegfried* and *Rinaldo*, the song of the bird is at first represented by woodwinds, as they most convincingly imitate the sound production of living birds. In fact, a woodwind instrument is little more than a vocal prosthesis, driven by breath, but with more flexibility and range granted by handing control to the more dextrous fingers.

In act II, Siegfried laments that he is unable to learn the language of the birds, and tries to do so by imitating its music. The whole sequence is an inversion of the serinette – it is the human who must learn to sing from the natural master of the art, just as Wagner himself did: in his autobiography, he speaks fondly of his parrot 'Papo', and reveals that he had 'listened long and attentively to the song of the forest birds, and [...] was astonished to make the acquaintance of entirely new melodies, sung by singers whose forms [he] could not see and names [he] did not know.'¹⁰⁷ Siegfried's attempt at mimesis, however, proves less astonishing, so he instead plays a few notes on his horn, attracting the dragon Fafner, himself a transformed half-beast, half-god, and slaying him. In killing the beast, he is finally able to achieve what through mere artifice he could not – he understands the song of the Woodbird, who is revealed to have been singing in language – that essentially human faculty - all along.

At this point, instruments having reached the limits of their effectiveness, the role of the Woodbird is taken over by a coloratura soprano voice, singing uncannily from offstage, guiding him at last to his climactic meeting with Brünhilde. Siegfried has slain the beast, but it is to another animal – a bird – that he must turn for fulfilment of his quest.

Adorno considered the Woodbird to be Wagner's most essentially operatic role, precisely because it exceeded human reason, invoking the otherworldliness of birdsong, dehumanising its singer.¹⁰⁸ At once bird and human, instrument and voice, the Woodbird successfully negotiates those most operatic territories – the boundaries between artifice and

¹⁰⁵ 'Siegfried, Act Two, Forest Murmurs' [n.d.].

¹⁰⁶ See, for example, Stenning, 2011: 80.

¹⁰⁷ Wagner, 1911: n.p.

¹⁰⁸ Adorno, 1999. The fact that Adorno's mother Maria Calvelli reached the pinnacle of her reputation as a singer with her own portrayal of the Woodbird (Vienna, 1885-86) is no doubt a coincidence. See Eickhoff, 2015.

nature, present and absent, earthly and sublime.

Indeed, birds seem to excel at all that the operative human is striving for. Bird bodies and habits both confirm their special status. A bird is literally ungrounded, unbound from earth, free to point itself towards heaven. When they do walk, it is upright on two feet rather than creeping or crawling like the literally 'lower' animals. Medieval and early-modern bestiaries and folk taxonomies distinguished primarily between birds, fish and four-footed beasts,¹⁰⁹ but they need not have specified the number of feet on a beast, except to exclude the human species. While man might be confused for a beast, a bird never is.

The bird is not embarrassingly naked, too obviously genital in the manner of blushing-ly endowed male mammals. Indeed, the bird is never naked, with its reproductive organs tucked away beneath a sheath of bloodless and desexing feathers. Its body is hidden just as the post-lapsarian human body is, under a cloak of something which is simultaneously concealment and adornment.

But it is not the bird's feathers, ultimately, that impress (or disturb) us, nor even the faculty of flight, which it shares with much less problematic bats and insects, but its song. There is a begrudging acceptance by even the most anthropocentric commentators of the day that birdsong certainly sounds like music, but most agree that birds do not actually hear their own song as music, or are indeed aware that they are making music at all. That birds sing is indisputable. On the other hand, music, they argue, is an expression of reason. The rational – in the literal sense, dealing with ratios, numbers, and harmony as a mathematical artefact – was deemed essential to music, and as they are not rational subjects (or certainly not considered as such) such sounds as birds make cannot, therefore be 'actual' music. However well a nightingale might sing, true appreciation of the music and its aesthetic pleasures was reserved to the human listener.¹¹⁰

While earlier thinkers considered imitation of natural sounds, especially birdsong, a likely precursor to the production of human music, by the end of the 18th century this idea had come to seem patently absurd. Schubart spoke for many of his fellow music historians when he called it 'childish and entirely contrary to the nature of humanity... that man learnt to sing from birds.'¹¹¹ This is humanist arrogance at its most unapologetic. Its indisputable origins in the body and its obvious precursors in nature notwithstanding, Enlightenment music was declared the exclusive provenance of the reasoning mind,

¹⁰⁹ Even now, there is vernacular ambiguity around animal, mammal, non-human, etc. See Topsell, 1973.

¹¹⁰ Leach, 2007.

¹¹¹ in Abbate, 1996.

tautologically human.

Such circular logic did not settle unease over the status of birds and their song in relation to humans. Birds were afforded a special place in even post-Linnaean taxonomies. As late as 1799, naturalist Charles White could assert that ‘the chain of being extends in two directions from Man – by the body through the orangutan, and by the voice through the birds,’ an assertion that reveals the importance of the voice as a defining feature of humanity. More striking still is the complex case of Millie and Christine McKoy, whose remarkable singing voices gave them a claim to personhood that otherwise, as conjoined twins born into slavery, they may have found unrecognised. Their stage name, Millie Christine, the Two-Headed Nightingale, acknowledges the ambiguous status of both the twins and the songbird.¹¹²

2.3 *Unreasonable Voices*

In a 1723 performance of Handel’s *Ottone*, his muse and protege Francesca Cuzzoni sang the aria ‘Sen Vola’ so uncannily well that a member of the audience was compelled to cry out: ‘Damn the woman, she has a nest of nightingales in her belly!’¹¹³

The outburst is amusing, but its content unremarkable. The nightingale is so frequently invoked in descriptions of virtuoso singing that the comparison smacks of cliché. But in remembering the real bird that casts this metaphorical shadow, we uncover the anxieties beneath this spontaneous accolade. The need to appeal to animal talents in a celebration of exclusively human achievement is a direct challenge to our position at the pinnacle of creation. Cuzzoni is being simultaneously praised and damned. Appreciation of her sublime artistry is framed in the nightmare image of a belly full of living birds.

We may be ‘psychologically disinclined to dismiss such a live and visibly embodied human voice as ventriloquized,’¹¹⁴ but wherever that amazing voice was coming from, it certainly wasn’t coming from Signora Cuzzoni herself. Ambrose Phillips wrote a farewell ode to her in which she is described as ‘empty warbler, breathing lyre’ - her voice betrayed her nature as thoughtless animal, perhaps, or besouled machine, but certainly not human.¹¹⁵ As much a singing cyborg as the bird at the serinette, she was poised in that hinterland between human, animal, and machine.

¹¹² *Biographical Sketch of Millie Christine, the Carolina Twin, Surnamed the Two-Headed Nightingale and the Eighth Wonder of the World* [n.d.].

¹¹³ Rogers, 1943:217.

¹¹⁴ Abbate, 1999: 483.

¹¹⁵ Phillips, 1781: 79.

The anonymous pamphleteer of 'The Most Wonderful Wonder' connected Cuzzoni and her rival Faustina Bordoni with another contemporary cause célèbre – Peter the Wild Boy, who had been found living in the forest, having presumably been raised by animals. Brought to the court of George I from the woods in Hanover, Peter scandalised the London *beau monde* with his questionably human ways, inviting comparison to that pair of Italian sopranos.¹¹⁶ The notoriously violent rivalry between these two early divas, who were to come to blows on stage, only confirmed their deficit of human reason, the beastly impulses that must be held in check by the Orphean influence of music.

Even at her best-behaved, though, the opera singer's hold on humanity is inherently tenuous – in thrall to the conductor, who is in turn in thrall to the score, she need not think, must not think, lest such thinking prevent her from making the not-quite-human sounds demanded of her. This is just as Deleuze predicts: 'Is it not first through the voice,' he asks, 'that one becomes animal?'¹¹⁷

The voice challenges notions of interiority, or the bounded body, in palpable, physical ways. With her wide-open mouth, in her deep exhalations, the singer renders arbitrary any border between interior and exterior. The illusion we have of access to a singer's mind is in truth an indirect physical contact with her body – expanding and contracting lungs, vocal cords precisely tensed, agile lips and tongue shaping the resultant pressure waves as they are projected outwards, propagated through the air. These pressure waves stimulate our middle ear, literally shaking us from within via parts of ourselves we can never see, the signal amplified with skin and bone and wetware, turned somewhere in our brains to the suicide of the Queen of Carthage, whose own internal world becomes available to us in ways that defy – even transcend – such reductionist explanations.

Though the body that produces this voice is recognisable as human, the voice itself aspires to a condition of otherness. Contemporary Soprano Sarah Leonard remarks, 'My voice and I can do far more than I realised!'¹¹⁸ While her body's rigorously trained vocal apparatus is under her control, the voice it produces is not. Instead, her voice remains a separate entity, a collaborator with faculties beyond her rational understanding. The truly successful operatic voice realises the enduring neo-Platonic ideal, acting as conduit to an immaterial world, even if that other world is one within. It is superhuman, unearthly, inexplicable. 'The mouth is magical,' Steven Connor tells us, because 'it constantly

¹¹⁶ 'The Most Wonderful WONDER That Ever Appear'd to the Wonder of the British Nation' 1726. The author is commonly assumed to be Jonathan Swift.

¹¹⁷ Deleuze and Guattari, 2004: 5.

¹¹⁸ In Barker, 2014: 149.

translates hardware into software, making something (meaning) out of nothing (mere sounds), and nothing (idea) out of something (matter).'¹¹⁹ Defying rational explanation, the singing voice that supplied the age's greatest entertainment was also an inconvenient reminder of the shaky foundations of the Enlightenment project.

Speaking, as the vehicle of language, is the near-exclusive territory of the human.¹²⁰ However, singing is not speaking – the identification of one with the other is the greatest challenge to the opera spectator. The mere semblance of speech, mere sound, may not be enough to convince us of the presence of a rational mind. Descartes admonishes 'If you teach a magpie to say good-day to its mistress when it sees her coming, all you can possibly have done is to make the emitting of this word the expression of one of its feelings.'¹²¹

If the magpie cannot convince us of her humanness by merely echoing a repertoire of pre-rehearsed syllables, which nonetheless have the desired effect on the listener, what then of the opera singer performing a role in a language learnt the same way, by rote, with sounds that off-stage, even to the singer herself, would not register as meaningful?

For opera creators and commentators alike, the shifting relationships between speech, song, and music, hierarchical or otherwise, have always been among its most pressing issues. The qualities which separate speech from song – increased regularity, the division of a continuum of sound or time into a discrete set of pitches or rhythms – are precisely those separating music from noise, or the baying of a pack of hounds from an operatic chorus. These creaturely noises might be considered not in opposition to one another, but lying along a spectrum of sound and meaning in which music and language feature independently.

Paul Barker extends the speech-song continuum in both directions: beyond speech, there is noise, with no musical content, and beyond singing, the vocalise, with no semantic content. 'The line of development,' he observes, 'now appears to be a circle.'¹²² In drawing a circle, Barker acknowledges a second dimension not accounted for in conventional single-parameter models. The dimension is that of meaning, and while we might instinctively assign musical/affective and propositional/symbolic meaning to two independent dimensions, experiments in cognitive psychology have shown us that musical and linguistic meaning operate in opposition to one another.¹²³

¹¹⁹ Connor, 2014: 104.

¹²⁰ Sebeok, 1965.

¹²¹ Cottingham, 1978: 556.

¹²² Barker, 2014: 69.

¹²³ Falk and others, 2014; Bonnel and others, 2001.

The musicalisation of language that results in song (through repetition, vowel extension, and the like) obscures its nature as linguistically meaningful, in a phenomenon known as semantic satiation.¹²⁴ The singing and text-setting styles which are defining features of the operatic voice rely heavily on such dehumanising strategies: a melisma extending a syllable far beyond the limits of normal comprehension, or a vowel rendered phonetically unrecognisable for the sake of volume or purity of tone.¹²⁵ Forgoing symbolic, referential content in favour of the merely auditory dehumanises singers by separating them from the propositional language through which we access the reasoning mind. But what the sung word may lack in semantic precision it can gain in affective depth, a level of expression unavailable to mere symbolic language, and unfalsifiable music supplies an anchor of emotional truth beneath.



Despite this semantic opposition, music and language remain intertwined. For example, every language has its idiosyncratic set of nonsense syllables which, while phonetically allowable in the target language, are used exclusively in music, or in reference to music rather than in normal speech. Various terms – ‘vocables’, ‘unintelligibles’, or ‘nonsense’, these quasi-words are most carefully considered in ethnomusicography, particularly in reference to the music of native North Americans.¹²⁶ Among the Navaho, these words are particularly associated with animals.¹²⁷ At its extremes, song can contain no words at all; that is, no propositional or symbolic meaning,

nothing exclusively human. Barker leaves his circle incomplete, recognising, as do the

¹²⁴ Lambert and Jakobovits, 1960; Kanungo and Lambert, 1963.

¹²⁵ Bonnel and others, 2001.

¹²⁶ Ninoshvili, 2009. The connection between operatic singing, animal song, and vocables is also made in Stenning, 2011: 80-82.

¹²⁷ To this quasi-linguistic category we might also add lexicalised animal cries such as 'woof', 'oink', or 'hee-haw'.

Navaho, that these two opposed poles of linguistic and affective meaning cannot be reconciled by the human voice. It is animal song, at once speaking and singing, perceptibly meaningful but (to the human observer at least) incomprehensible noise, that fills that gap.

A bird's performance employs song as a complete language. With no distinction at all to be drawn between words and music, animal singing realises the unattainable opera ideal. The highly contested human space shared by these elements of the opera performance finds itself further encroached upon by the animal Other.

While a dog's ability to speak is approached with extreme Cartesian scepticism, many do convincingly, if not artfully, sing. Indeed, the parameters which differentiate speech from song are formal properties of the sound being produced, and, although the semantic counterpoint of language and music offers a potential layer of meaning unique to the sung word, the song need not be coupled with any meaning being generated by language, and thus the act of singing would seem to require no reasoning human mind at all.

Even when the text of a song, if any, is not subject to such extreme manipulations, the act of singing itself is potentially primitive and animal. Singing is made of voice, and has origins in the body of a singer. While song may not have meaning in the semantic sense, it has the potential at least to convey affective meaning to the listener. Its function as the

Figure 9: Severe phonetic restriction and paralinguistic communication via 'vocables' in imagined animal speech.

exteriorisation of a singer's internal state implies – demands – an embodied subjectivity from its performer.¹²⁸ When a non-human sings, therefore, be it parakeet, whale, or thrush, we must

acknowledge the potential, at least, of its own subjectivity, as witnessed through its compulsion to communicate. From there it is a short but profound step to acknowledging the non-human mind, reminding us along the way the mind has other functions than merely to think, other ways of asserting its existence beyond the Cartesian formula.

But Descartes is relentless, turning his sights from the speaking magpie to the behaviour of animals in general, adding that 'all the things which dogs, horses, and monkeys are made to do are merely expressions of their fear, their hope, or their joy; and consequently, they can do these things without any thought'¹²⁹

¹²⁸ A recent study of the comparative biology and evolution of music defines song as 'complex, learned vocalization', adding that this definition of song 'also applies to humans, with one caveat – that music lacks composite, propositional meaning – necessary only to distinguish it from spoken language.' Fitch, 2006.

¹²⁹ Cottingham, 1978: 556–57.

How this mode of thoughtless expression is distinct from that of the highly-trained opera singer is less clear. The opera singer herself cannot conceal her own animal nature. The internal workings of her mammalian body ostentatiously foregrounded in the expression of primordial emotions shared by even the most distantly-related creatures, the display of her finely-honed craft temporarily loosens her claims on humanity.

Singing, we can admit at last, is an animal act. Opera's guiding formal principle, the attempt to unify speech and song in recitative, is at its heart a heroic attempt at the synthesis of 'human' mind and 'animal' body. We see the singer for the animal he is – a perfect specimen, like a prize steer, expensively maintained and rigorously trained to perform extraordinary, unnatural feats on cue. We are uncomfortably reminded that the voice is not an immaterial phenomenon granting access to the noumenal world, as suggested by commentators on opera from its earliest days.¹³⁰ The voice emerges from the animal body as breath – not immaterial at all, but indeed a biological waste product fashioned into an object of aesthetic value.¹³¹ The human animality on display with every sung word supplies the compelling weirdness and wonder of opera, inspiring its harshest critics and fiercest advocates to the heights of scorn or sublime pleasure.

¹³⁰ Duncan, 2004.

¹³¹ As an operatically disinclined friend of mine commented after an intense love duet, sung close-up and *fortissimo*, 'Ewww, he's breathing all over her!'

Chapter 3: *Arthropoda* - Forays into the World of Insect Opera¹³²

3.1 *Why Insect Opera?*

My own fascination with invertebrate life made the choice of subject species (or in this case, phylum)¹³³ rather a foregone conclusion. Still, while the experiences of non-human animals in general may be, as I argue, fitting, obvious, and woefully underexploited sources of serious music theatre, a specific focus on arthropods warrants further explanation beyond the vicissitudes of my own taste and experience. After all, the mass of insects are at first glance everything that opera is not—small and verminous, carriers of disease, feeders on every conceivable kind of waste, literally low, creeping things. Jewel-winged, airborne superstars of the insect world such as dragonflies and butterflies are the dazzling exceptions to a much more distasteful rule, the arthropod equivalent of the ‘charismatic megafauna’ commonly referred to in animal studies discourse since at least the 1960s. Even these are best seen from far away, in adult form – the dragonfly larva is a science-fiction nightmare, and caterpillars are literally verminous. This does not make insect opera a kind of anti-opera. On the contrary, despite our atavistic aversions and these unappetising truths, there is much about the insect world, and its various articulations with the human, both as species and notion, that makes it an ideal candidate for the operatic subject, or ideal subject for the operatic treatment.

There are few art-forms as obvious as opera, and the adjective ‘operatic’ can seem to stand in for any quality of excess – louder, larger, replete with too much meaning, a form so inherently multi-modal that contrary ideologies might leak out through one channel or another. It perches unsteadily on the borders between speech and song; it is at once in utter earnest and gloriously kitsch; it seeks emotional truth in a context of the dramaturgically bizarre. Nick Till adds ‘the primal and the camp, the pure and the hysterical, the grotesque and the sublime’ to the litany of opera’s internal contradictions.¹³⁴

Its essential premise, that a world might exist whose inhabitants don’t notice themselves singing, nor the orchestra that accompanies them, stretches credulity (or patience) to the breaking point.¹³⁵ Even its staunchest advocates feel compelled to write whole books in its

¹³² The title of this section is drawn from Jakob von Uexküll’s influential exploration of non-human perceptual worlds, termed *Umwelten*. He concludes with a theory of meaning that does not relate exclusively to human cognition. von Uexküll, 2010.

¹³³ The phylum Arthropoda replaces the Linnaean Insecta.

¹³⁴ Till, 2004: 20.

¹³⁵ A more nuanced discussion of the diegetic singing problem in opera is in Kivy, 1994.

defence.¹³⁶ Its very survival is a mystery. Yet it survives. As familiar as it is bizarre, opera's paradoxes make it a liminal form naturally subject to taboo, like the pangolin among the Lele people, or insects everywhere.¹³⁷

Current inclusion of animal characters in opera, sparse as they may be, is the outcome of a trajectory which has been developing since its inception – the range of characters available has crept its way down the great chain of being from the gods and demigods of the seventeenth century through historical heroes and aristocrats to the common and the marginalised. This pattern finds itself reflected in the ethical theory of Peter Singer, a key figure in the animal rights movement, who proposed an expanding circle of moral consideration or personhood that extends outward from the self, eventually encompassing all of humanity (however it might be defined) and further, to include non-human animals,¹³⁸ a pattern also noted historiographically by Erica Fudge.¹³⁹ After the various quadrupeds given voice in the repertoire, invertebrates are an inevitable further step.

Such work would also address a staggering imbalance of representation, given the fact that by nearly any measure, be it in terms of population, biomass, or diversity, insects are by far the most significant creatures on the planet. Robert May, writing for *Nature* in 1986, could not maintain his scientific detachment at his own findings that 'to a good approximation, all species are insects,' concluding with an astonished '!'¹⁴⁰ What more appropriate subject for a form notorious for all manner of excesses?

Welcome or otherwise, insects make their presence known in every human habitat, making them familiar objects of fascination, contempt, or disgust. They are the biological Other that refuses to respect the boundaries of the human world, persistently verminous. Yet even as we live surrounded by them, they live on such radically different scales from our own that they barely figure in our perceptual worlds, our *Umwelten*, except as mere flashes of colour, patterns of motion. Would we recognise them up close? Would we even know them by their true names? For many, they are simply 'bugs' - not simply a misnomer, but one that, even used correctly, occludes a taxonomic diversity at least as broad as the one that includes lemurs, baboons, and us.

Though their ubiquity makes them in one sense unremarkable, insects remain inescapably Other. Which of those dozens of eyes is window to the insect soul? Does shit taste good to

¹³⁶ Swanston, 1978.

¹³⁷ Douglas, 1966.

¹³⁸ Singer, 1981.

¹³⁹ Fudge, 2004: 9.

¹⁴⁰ May, 1986.

the fly? Does some taste better than others? Steven Shaviro attributes our instinctive horror of insects to the base biological consequences of the half-a-billion-year taxonomic rift between us: 'The insects' modes of feeding and fucking [...] are irretrievably different from ours. Looking across the vast evolutionary gap, we are seized by vertiginous shudders of gastronomical nausea and sexual hysteria.'

These are sensations familiar to the insect-watcher and opera-goer alike. Spectacles of sexual hysteria are frequent occurrences on the opera stage, and nausea, the gut feeling, is an embodied experience more appropriate to the ultra-visceral operatic mode of expression than to written or spoken words.

'Insect life,' Shaviro continues, 'is an alien presence that we can neither assimilate nor expel.'¹⁴¹ This combination of easy familiarity and irreconcilable otherness makes arthropods ideal subjects for exploring beyond the limits of readily experienced mammal intersubjectivity. Ashley Cross, reviewing a range of animal studies perspectives, confirms them as 'figures that could – precisely because of their radical difference – measure the limits of human sympathy.'¹⁴² J. W. B. Haldane finishes his consideration of mammalian perceptual worlds with a heroic cry for a more daring interspecies exploration – 'But a dog is too near us. Let us go to the insect.'¹⁴³ – that need not be met with our habitual biophobia. Opera is an ideal stage on which to confront these paradoxical creatures, realign our unknowing, and approach the arthropod subject with wonder.

More obviously, insects are also natural sources of sound. They might be drawn onto the stage for plain dramaturgical convenience. Whatever our squeamishness, perplexity, or fascination at their alien modes of living, we share with them the capacity – the necessity – for song.

3.2 Life Stories

In the series of experiments that make up *Arthropoda*, the trio of miniatures called *Life Stories* act as the equivalent of a control, a minimal interference with traditional opera dramaturgies, and a minimal shift away from traditional modes of animal representation. These disruptions remain nonetheless significant. Given the consistent exclusion of the singing beast from the serious repertoire, the presence of an animal protagonist is enough to make your opera ontologically suspect, whatever other characteristics it shares with the form as a whole. '*Pthirus*' is our first and most cautious foray into insect opera, and the one

¹⁴¹ Shaviro, 1995.

¹⁴² Cross, 2014.

¹⁴³ Haldane, 1930: 270.

that clings most closely to tradition, both as a piece of music theatre and in the treatment of its animal subjects.

i: *Pthirus*

The organism telling its operatic story here is a familiar one – *Pthirus pubis*, one of three species of lice that have been our companions since humanity emerged, and one of the largest and most recognisable of those countless non-human species for whom the human body serves as both nourishment and habitat.¹⁴⁴ *Pthirus* occupies an ecological niche not much different from that of one of Animal Studies' best-known case studies, the tick, who mechanistically negotiates a sensory world both impoverished and alien, made up of butyric acid and temperature gradients.¹⁴⁵ In comparison to the bold and adventurous tick, the louse leads a predictable existence in an even more sparse perceptual world. He is born on his host and need never leave, except when another host presents itself and he might cross seamlessly to a new environment, an *Umwelt* practically identical to the last. Solutions to the problems of louse survival are worked out on an evolutionary timescale, in Malthusian dimensions – an individual lives a life unburdened by decision.



The stage is a field of human skin, more or less densely forested with megascale hairs which stretch out of sight into the space

¹⁴⁴ In fact, a mistransliteration of the Greek *φθιρυς*, but taxonomic practice demands that Linnaeus's vestigial misspelling endures. Subsequent authors (some of whom are cited here) often miscorrect the genus to *Phthirus*.

¹⁴⁵ von Uexküll, 2010: 44–46. The notion of animal life being 'poor in world' recalls Heidegger.

above. Clinging on to these hairs are enormous lice (Pthirus pubis), crafted as accurately as possible. They are considerably larger than the human performers who give them voice, and although there is a suggestion that a human singer might be inside, no part of the human body emerges from the louse body, excepting the mouth and perhaps, should participants be willing, the genitals. No attempt, either, is made to adjust the shape of the louse to accommodate the humans operating it from within.

The stage directions are blunt and precise, demanding, impossible. Such extravagances are a key signifier of the operatic, and Harrison Birtwistle has suggested that the very impracticality of staging opera is one of the things that generates new productions.¹⁴⁶ A trompe l'oeil effect is taken for granted in the very first line—the stage does not appear to be, but rather is a field of human skin. The accompanying digitally-enhanced photomicrograph is a further pressure towards a disingenuous hyperrealism in which the human performer is entirely integrated with a contraption of human devising: a veritable cyborg. The fleshy singing body is not uncomfortably present but concealed, internal, rendered featureless.

The singer's relationship with stage machinery reflects a pattern of morphological reduction typical of the parasite body. For purposes of the performance, much of that now-irrelevant human body is parasitic, expending energy but performing no function. Within those exoskeleta lie the ultimate opera singers, bodies devoted entirely to the production of voice, all other essential functions having been co-opted by the score and the puppeteers. In fact, beyond conceding the necessity of a vocal apparatus, (with the rhetorical, though not entirely gratuitous, challenge of revealing genitals as well) the human within may as well not exist at all, the entire piece presented as an Animatronic tableau, performed by uncanny mimetic machines. The more traditional costume designs that I considered, such as a hybrid eighteenth-century/insect carapace design, decked, perhaps, with outrageous codpieces, while visually and theatrically striking, would draw us even further away from the insect world into the human, the visual juxtaposition emphasising difference and not merely obscuring the animal beneath the parodic human, but making both ridiculous.¹⁴⁷ This complete disappearance of the human form has the added benefit of breezily sidestepping the challenge of adapting the quadruped bodyplan to an arthropod shape, that most formidable of barriers to performance-as-insect.

¹⁴⁶ Beard, 2008: 20. Birtwistle is referring in this case to Wagner's *Ring*.

¹⁴⁷ Laba, 2002.

When it comes to human performance, invertebrates have problematic bodies: either bristling with extra limbs or lacking them entirely, armoured and articulated or amorphous and jellylike. The easy mapping of homologous structures which is the inevitable blessing and curse to the performer in representations of phylogenetically closer organisms is not available. Any attempt at mimesis would have to acknowledge the performer's insufficient human body if not entirely concealed. Thus, stage portrayals of insects abound with disproportionately (not to say disappointingly) small vestigial wings and dangling, useless second pairs of arm-legs, if the inconvenient extra limbs aren't dispensed with entirely.¹⁴⁸ The intricacies of insect form are necessarily replaced by stripped-down iconic signs. Even leaving aside their behaviour as represented in unabashedly anthropomorphising dramas,¹⁴⁹ their very portrayal by means of the human body reduces their insectitude, effacing the otherness that makes them prime subjects for wonder, or for horror.¹⁵⁰ The bizarre face of the butterfly, bristling with setae, mouthless but for a coiled tube tongue, dominated by compound eyes that look in every direction at once, is potentially fearsome or repulsive at human scale. Instead, at sufficient physical and cognitive distance, the butterfly is reduced to the sum of its highly visible coloured wings, acting out human fantasies of flight, beauty and freedom from care.

Unlike butterflies, lice are neither visually appealing nor encountered at an innocent distance. Puccini did not, after all, invite us to weep for the tragedy of *Madam Louse*. A 2013 study of reactions to louse infestation revealed a catalogue of antipathies, brought on by the insect intrusion into our human lives. We are made uncomfortably aware that the lice are not simply on us but of us, reshaping the material of our bodies to build successive generations of their own: we react with disgust, horror, feelings of uncleanness, while our minds suffer anxiety at the social stigma of infestation, at what these lice mean.¹⁵¹ That is, 'What do these lice mean about *me*?' Disgust and shame are not directed at the louse, but at the unwilling host, the infested self, its alien fecundity.

For an animal so rich in associations, and which evokes such powerful responses, the louse is curiously devoid of character, unburdened by any human attributes fossilised by convention. The fox is 'cunning', the owl is 'wise', the lion 'noble'. The louse has no such

¹⁴⁸ Composer Kelvin Thomson deliberately avoided the onstage portrayal of operatic bees (in *The Silence of the Bees: a Science Opera*, 2013) in order to avoid the lack of gravitas. Personal communication with author, 2013.

¹⁴⁹ See for example Lorca, 1970; Čapek, 1996. The latter was adapted as the opera *Insect Life* in 1987 by Kalevi Aho.

¹⁵⁰ Consider David Cronenberg's 1986 film *The Fly* and its 2008 opera adaptation by Howard Shore.

¹⁵¹ Parison and others, 2013.

adjective. He has lost even its thingness to become the adjective 'lousy'. Lice are not metaphorical animals but metonymic, not symbolic but indexical – whatever human meaning they may have is drawn not simply from passive observation and projection, but from their interactions with humans and their influence on the human world.¹⁵²

Although lice have been our constant companions, their behaviour unchanged for millions of years, their close relationship with humans has led to drastic shifts in meaning as we hosts differently experience and reconsider the consequences of this evolutionary intimacy. It is our ever-changing understanding of such interspecies articulations that leads to the 'historical instability of the animal body,'¹⁵³ the profound disconnect between the animal seen-as-something and the animal simply seen which can make even as straightforward an animal as *Pthirus* a problematic metaphor. Indeed, in the same 2013 study, the authors make clear that 'the power of the cultural connection of meaning about this insect is apparent in the contrasting human interactions with head lice in several indigenous populations worldwide where the insect operates as a source of positive social bonding.'¹⁵⁴

Opera's oft-stated aspirations or even claims to universality are tested to the limit by confronting creatures which live both inside and outside human history. The meaning of a louse is unstable both in space and time. While today's lice are a rarity, at least among the indigenous populations of the opera house, the louse was a daily fact of life even among the wealthiest, presumably the most hygienic and comfortable, strata of society, from Roman aristocrats to Ferdinand II of Naples.¹⁵⁵ In the 17th and 18th centuries, as opera climbed to its ever-more-dizzying heights of prestige, so did the parasite populations of its patrons, to such an extent that it was common practice to shave one's head and wear a wig, though even this drastic measure was no guarantee against infestation, as Samuel Pepys noted in his diary.¹⁵⁶ Lice remained an unpleasant reminder that humankind's dominion over the natural world, lost through sin in Eden, had not yet been restored at even this smallest of scales, this nearest of distances.

The louse was a reminder of the Fallen, embodied self, a feature shared with animals, anchoring the reasoning mind inconveniently to a vulnerable physicality. It recalled not just our bodily frailties and diseases, but its pleasures. Delousing was familiar enough a practice to carry with it no sense of shame. On the contrary, it was to become a common subject for

¹⁵² Lévi-Strauss, 1974: 204–8.

¹⁵³ Baker, 1993: 45.

¹⁵⁴ Parison and others, 2013: 170.

¹⁵⁵ Fornaciari and others, 2011. 'This is the first time these parasites have been found in the hair of a king.' 113.

¹⁵⁶ Weiss, 2009: 24.

Dutch genre painting, in no small part because of the intimate access a louse had to the female body.¹⁵⁷ Literature, too, exploited these intimacies, and the louse became an object of envy for many a love poet, including John Donne.

It sucked me first, and now sucks thee,
And in this flea our two bloods mingled be;¹⁵⁸
Thou know'st that this cannot be said
A sin, nor shame, nor loss of maidenhead,
Yet this enjoys before it woo,
And pampered swells with one blood made of two,
And this, alas, is more than we would do.¹⁵⁹

In the 20th century, when it was discovered that lice were vectors of typhus, the innocent companion became a sinister reminder of human brutality, thriving best in the inhumanity of slums, wars, and prisons.¹⁶⁰ The high eroticism Donne finds in the louse's role as mixer of human blood would take on another sinister resonance during the 1980s AIDS crisis.¹⁶¹

In his survey of parasite poetry, armed with a twentieth-century understanding of louse/human interactions and their consequences, literarily-inclined consultant dermatologist D. A. Burns expresses surprise at the great volume of poetry about human ectoparasites, at the playful or innocent characters attributed to them, and at the single exception – *Pthirus*. The crab louse alone among our insect parasites carries no disease and inspires no great poetry. 'It is a pity,' Burns remarks, 'that this much maligned louse has not, as far as I am aware, attracted the attention of a poet whose creativity stretches beyond "There was a young lady from Hitchin...."'¹⁶² While correctly identifying that a 'low' animal has a more conventional place in a similarly 'low' theatrical form, he regards *Pthirus* as a merely biological rather than social phenomenon. The other lice, although potential vectors of deadly infections, are indicative merely of squalor and social disorder. While the crab louse carries no infection, it itself is the disease. The louse becomes a tell-tale sign of sexual non-normativity, and being subject thereby to yet another taboo, presents a further enticement to operatic representation.

Thus, though lice themselves may be ahistorical, the language and music of '*Pthirus*' locates

¹⁵⁷ Potter, 2013.

¹⁵⁸ Such mixing of blood meals suggests the feeding habits of lice rather than fleas.

¹⁵⁹ Other such examples abound.

¹⁶⁰ Crawford, 1913: 6–17.

¹⁶¹ Reidpath and Chan, 2005.

¹⁶² Burns, 1991. One hopes he would be gratified by the current project's operatic treatment.

these insects at a time when they might be seen, as John Donne saw them, as innocent go-between, a creature with enviable access to the warmer, darker parts of the woman he desired, without the sinister or squalid overtones they might otherwise convey.

RECITATIVE

LOUSE ONE

Behold, o my brethren, behold, the incomparable
beauty of our surroundings!
Under the protecting veil of darkness, as far as eye
can see or legs can range, a landscape pleasing and
benevolent in every detail, a perfect world!

LOUSE TWO

A perfect world for a haematophagic ectoparasite...
Why, the very ground beneath us radiates a constant
nurturing heat.
All is made for our pleasure, our convenience and
our dominion.

DUET

LOUSE TWO

What wind or storm, what ice or snow,
shall ever interrupt this temperate bliss?
These stalks of hair are exactly a legspan apart, precisely
a claw's-width thick.

LOUSE ONE

See how these keratin shafts and pegs
on which to climb, cement our eggs are
perfectly spaced for louse's legs.
What providence!
Give thanks!

LOUSE TWO

What need for hunger? To feed our hunger
we merely extend our mouthparts down to
pierce the capillaries' haemoprotein bounty
flowing through the epidermal ground.
What providence!
Benevolence! Give thanks!

Chorus

LOUSE ONE

*(moving towards a female on a different hair, then joined
contrapuntally by the others, who sing as they mate)*

Such willing females did he supply that
 with his command we might comply:
 Go forth, be fruitful and multiply!
 What providence!
 Benevolence!
 Such elegance!
 Give thanks, give thanks.

(both male lice mount and mate females)

ALL FOUR LICE

Give thanks, give thanks, for we are loved of God.
 Give thanks, give thanks, we are his chosen creatures.
 Who doubts that in his image we are made?
 We share his higher purpose and his features.

Our every need this Eden will suffice.
 For us he built this paradise
 and peopled it with anopluran lice.
 Give thanks, give thanks!
 Providence!
 Benevolence!
 Providence!

In form and instrumentation, the lice's song is suggestive of the Baroque era. The language employed locates these lice even more precisely in human culture, opening as it does with a Protestant form of address ('Behold, my brethren, behold!') and continuing in the same vein, with cries of Providence! and Benevolence! A familiar quote from Genesis reasserts the Edenic theme, the lice taking on the command to 'be fruitful and multiply.'¹⁶³

Embedded within this mannered religiosity are moments of equally mannered scientific language. Here, coupled as they are with musical architecture and vocal-instrumental textures reminiscent of the Enlightenment era, the scientisms may just as easily come across as pompous or pedantic as lyrical. In fact, the voice of biological authority lent to the libretto by the quasi-scientific vocabulary disguises factual inaccuracies that ultimately betray this as a human, rather than Pthiran, story.

The firm grounding in human culture might offer the spectator a familiar, more comfortable vantage point from which to witness insect experience, and though the choice of style might be justified from a human perspective, from the standpoint of insect authenticity, it is the least satisfying aspect of the piece - in being so specifically historical, it becomes more specifically human, taking attention away from the facts of louse life being presented on stage. What's more, while the physical details of both the organism and its

¹⁶³ Genesis, 1:28

environment are broadly reflective of the actualities of *Pthirus* biology, their meditations upon them are unmistakeably anthropomorphic.

The elegant correspondence between the louse's lifestyle, its anatomy, and its environment is well documented.¹⁶⁴ It is this single kernel of entomological truth around which I developed the rest of the libretto. From an Uexküllian standpoint, the most disruptive detail is the winter weather mentioned in the first duet. More importantly, I ignored the truth of *Pthirus* dispersal, adjusting it to accommodate a human narrative of masculine conquest. In fact it is the pregnant females who are the more mobile and adventurous sex, the conquerors of new territories. In haphazardly adopting a human stereotype, I missed an opportunity to consider human notions of colonialism and gender through the lens of an animal Other. The human model consistently took precedence over insect authenticity, undermining even the biopolitical intent of the satire. The anthropomorphisms of language are so extreme that the lice, in referring to themselves as ectoparasites, speak from the perspective of their hosts.

The notion of whether lice have a God is more problematic. We cannot share the louse's wonder at a benevolent creation, long since cast out of Eden as punishment for our knowledge of good and evil – our very human-ness. Our mechanically-aided triumph over our environment is a symptom of weakness as well as a demonstration of strength. These lice, however, are enviably Prelapsarian – naked, shamelessly mating, filling their day with pleasure and with praising God. They are more reliable servants of their creator than their human hosts.

Reflecting on the miraculous interconnectedness of the environment which is so often used by humans as evidence of a creator, they demonstrate a cosmology as logically flawless as any Great Chain of Being. In *Possible Worlds*, Haldane invents an equally preposterous arthropod religion based around worship of the Great Barnacle, to remind us that 'Man is after all only a little freer than a barnacle. [...] I do not feel that any of us know enough about the possible kinds of being and thought, to make it worth while taking any of our metaphysical systems very much more seriously than those at which a thinking barnacle might arrive.'¹⁶⁵

For a louse to believe that the world was created with lice in mind, that lice were created in God's image, is no more ridiculous than human indulgence in analogous thinking. Other

¹⁶⁴ Nuttall, 1918.

¹⁶⁵ Haldane, 1930: 280–81.

discomfiting parallels, or ‘outrageous correspondences’¹⁶⁶ between the worldview of a louse and the myopic anthropocentric worldview become more apparent. Talking animals are doing their time-honoured job of deflating the pomposities of human society rather than revealing, as with the human opera subject, their otherwise inaccessible inner worlds. Somehow, despite its imposing physical presence on stage, the animal is rendered invisible, or irrelevant. Instead of regarding with wonder the other side of the intersubjective divide, we laugh at our own pretensions, or marvel at our own mimetic achievements. In holding a mirror up to humanity, these singing lice block out all but the smallest glimpse of themselves. Even though the intended target of the satire is the anthropocentric rather than specifically Creationist world-view, I undermined its message by tethering it to so many human points of reference.¹⁶⁷

Any anthropomorphic representation can be antagonistic to animal authenticity. Audiences conditioned by centuries of talking animal satire, which depends on us seeing the animals as something other than animals, are likely to bypass the more subtle biophilic implications in favour of the traditional carnivalesque reading appropriate to the deceptions, attempted murders, and repeated acrobatic executions of Stravinsky’s 1916 *Renard* or the anthropomorphic absurdities of Edward Bond and Hans Werner Henze’s *English Cat* (1983). In fact, it is the second of these, with its straight-faced, parodically (im)precise use of eighteenth-century dance forms, that the pastiche of ‘*Pthirus*’ most resembles. The very fact that the animals speak, with its attendant implication of satire, leads us to seek some human meaning behind the represented animal, excluding the possibility that the lice might be singing about themselves, as themselves. As Steve Baker notes, ‘Across the range of the talking-animal story, there recurs a fascinating and perplexing motif. It is the assertion that in these stories the image of the animal [...] does not signify ‘animal’ at all. Animal presence is consistently explained away.’¹⁶⁸

The other human language granted to (or forced upon) these arthropod singers is music – in this case, I adopted common practice in the academic tradition, only slightly expanded by the treatment of seconds and sevenths as consonant intervals and the rhythmic dilation, emphasised by the timpani, used to lend interest to the imitative counterpoint of the chorus.¹⁶⁹

The few bars at the final cadence, where individual string parts come as fast-moving but

¹⁶⁶ Perry, 2004: 19.

¹⁶⁷ Perry, 2004.

¹⁶⁸ Baker, 1993: 136.

¹⁶⁹ Score available on documentation disc.

harmonically static figures in their highest octaves, give us the moment in the music that sounds the most "insectile", though *Pthirus* is, as far as we know, a silent animal. The piece reverses the standard Orphean charm by granting them the faculty of human song.

Though at times made quaint or insubstantial by its many anthropomorphisms, there may be an ecopolitical urgency to '*Pthirus*' after all. Recent reports suggest that habitat loss has led to cataclysmic decline in crab louse populations.¹⁷⁰ *Pthirus* may yet join ranks with that ever-growing group of species threatened by human activity with extinction.

ii: *Melolontha*

With '*Melolontha*', I sought to remedy some of the more obvious anthropocentrisms of '*Pthirus*' while still recognisably within the bounds of conventional opera practice. The title character is another familiar insect with a common name – the cockchafer. The species has a long and contradictory relationship with humans, from its role as destroyer of crops, for which the larvae of Lausanne were excommunicated in 1478, to its widespread use in folk medicine and in food.¹⁷¹ More commonly today, the cockchafer is metonymic of spring, for those who call it the May-Bug.

Because it feeds on our cultivated lawns, it is much studied, although the scrupulous detail with which this beetle's life cycle and habits are documented seems at odds with the insecticidal purpose of such studies. As a librettist, however, the wealth of information afforded me an opportunity to present the observed rather than purely imagined life of the insect.



Figure 8: Melolontha on his back

¹⁷⁰ Dholakia and others, 2014.

¹⁷¹ Ratcliffe, 2006: 90.

'*Melolontha*' was inspired by a moment of insect life witnessed first-hand. The already ungainly-looking beetle has managed to land on its back, and struggles to right itself, all six legs a-wriggle, and wings occasionally buzzing out from beneath protective elytra, in what can only be a method of last resort. The parallels with human experience implied by the lyrics are manifested in a staging in which these parallels are embodied.

Isolated in a pool of light, a human-scale articulated model of Melolontha melolontha, on his back. His legs kick and wriggle, moved by visible cords coming down from above him, as a marionette.

The ropes do not quite disappear into the darkness above, but meet a system of pulleys and connect at the other end to the singer, upstage and raised slightly, in his own pool of light.

The singer is similarly on his back, similarly helpless. With cords attached to all four limbs, he operates the puppet beetle with kicks and wriggles of his own.

From time to time, the beetle's elytra separate and his membranous forewings briefly emerge, ineffectually buzzing.

Inescapable anthropomorphisms

If we are to hear animals tell their stories, we must put words in their mouths. Other than the prerequisite faculty for human language, part of the ontological anthropomorphism of the performed animal, this beetle also has a memory, a continuous identity across bodily transformation. In the score, I excluded the final stanzas of the libretto text, eliminating the reference to the insect's present experience as well as its fear of the unknown. The result is a peculiarly operatic anti-drama, a moment of inaction experienced entirely internally, but expressed through song.

MELOLONTHA sings:

In the grub days
In the smooth cool underground days
I, master-builder
I, burrow-master
Not a rootlet, not a rhizome escaped my devouring jaw

three times i rose and fell
the warm to pull me upwards
to a layer of plenty
among the reaching grasses

to feast and feast

many a curious thrushbill did i evade
 there were none so fat and white as I
 shaken by thundering mole far below
 earth-tearing fox paws
 and badger marauding above
 lay still and silent and survived

three times rose and fell
 each time fatter than the last
 three times split through my tightening skin
 released released to feast and feast
 until the chill came to drive me down again

Three times
 before the long deep
 the great sleep

i didn't know then it was dark
 i didn't know i was beneath
 i didn't have these brittle legs
 i didn't have these heavy wings
 i feared no owl i feared no bat

sheltered by earth in the grub days,
 in the smooth cool underground days.

The language is stylised, though no longer, one could argue, 'elevated' in the spirit of Ficino. Syntactically stripped down, the structure of the text is still formally bound, typified by grammatically or phonetically rhyming couplets. The use of kennings like 'burrow-master' along with the practically monosyllabic vocabulary give it an earthy, Anglo-Saxon primitivism in comparison with the neo-Latinate tweedlings of '*Pthirus*'. Though still reminiscent of a specific human style, it is a style of arguably more biophilic resonance.¹⁷²

In the case of '*Melolontha*', and in stark contrast with the highly abstract '*Pthirus*', I avoided the temptation to reveal the insect's inner world, but merely describe his experience. His seasonal migration to the surface to feed, three-year life cycle, and major predators are details drawn from observation, and I considered the larval coleopteran sense world when incorporating these into the text.¹⁷³ This more rigorously objective text, supported in its

¹⁷² Such as found in the writing of William Morris, J. R. R. Tolkien, et al. See Jones, 2010.

¹⁷³ See, for example Packard A. S., 1873; Mann, 2004.

denotative role by natural prosody and syntax, lends a clearer division of semiotic labour between referential word and affective music.

Having prioritised my adoption of an insect perspective at a presentation of this work in progress I asked the audience which words they thought most offended this principle. For me, preoccupied with Uexküllian accuracy, the impossible word was ‘white’: there is no way for a beetle larva to know his own colour.

A much more revealing reply suggested that the offending word was ‘I’.¹⁷⁴ This may not be a denial of the possibility of insect subjectivity, but rather a response to the utter weirdness, ontological instability, and threat to our own human individuality that is the holometabolous life history. Arthropods with complete metamorphosis challenge the very notions of individuality and bodily integrity that are among humanism’s great preoccupations. A caterpillar is not a butterfly – it must become a butterfly, dissolving into undifferentiated soup and rebuilding itself from molecular constituents. Such radical en-otherings of the self, being beyond the limits of human experience, are the natural territory of opera.

Nevertheless, while I sought to render a more genuinely insect experience, this most operatic of experiences is never directly addressed. We cannot pretend to know what it is like to be a bat, much less a cockchafer.¹⁷⁵ Furthermore, the mature beetle is voiced by a baritone, aligning it with operatic tradition and human rather than insect physiology. The ascription to the cockchafer of memory and his internal state, communicated through long-established musical codes (mournful, nostalgic descending minor thirds are punctuated by optimistic arpeggios and upward modulations) tilt the balance again firmly towards the human.

The score of *‘Melolontha’* only hints at the possibility of musical mimesis in the instruction to play a snare drum ‘when the membranous wings are fully extended’, acting as a suture between the music and the action onstage.¹⁷⁶

Other than this direct mimetic gesture, however, the music I wrote to accompany this text is resolutely tonal and heavily influenced by American minimalism, from its sequences of

¹⁷⁴ My thanks to Katie Grant for this insight.

¹⁷⁵ Nagel, 1974.

¹⁷⁶ Though the sounds of insects seem to have little to offer the composer in the way of musical material, beyond fast chromatic passages, drones, and tremolos, insect song has been imitated by composers as diverse as Josquin Desprez (*‘El Grillo’*, 1505), Rimsky-Korsakov (*‘The Flight of the Bumblebee’* from *The Golden Cockerel*, 1909) and George Crumb (*‘Night of the Electric Insects’* from *Black Angels*, 1971)

unresolved sevenths to its mallet percussion and overlapping staccato wind figures, although these textures and instrumentation are arguably more dry and exoskeletal than other potential available ensembles, such as a brass quintet or a Mahlerian orchestra. Drawing as it does on such a well-established (and well-explored) musical vocabulary, *'Melolontha'* does not avoid, I suspect, the 'sub-Sondheim banalities' Nick Till identifies in the operas of John Adams,¹⁷⁷ an impression enhanced by the driving rhythms, the use of stepwise upward modulations as a formal device, and the spare use of melisma in the setting of the text – all techniques to be found more commonly in the pit band of commercial musical theatre. Otherwise, while the looser form and less obviously mannered style of *'Melolontha'* steers clear of the out-and-out pastiche of *'Pthirus'*, even opera's transparent musical medium cannot prevent acting as a humanising lens.

The beetle finishes as he started, trapped, frantically but irrelevantly mobile. Though the song is sung in first person, *Melolontha* speaks from outside his own narrative, telling his story in retrospect rather than living through it. The singer is not merely at a temporal remove from the experience it relates, but also, if the stage directions are followed, physically separate from the body that experienced it.

In an attempt to compensate for the effect of the anthropomorphisms inherent to the music and text, I wrote stage directions to establish interspecies affinity through an exact gestural correspondence between the singer and the beetle puppet he operates. This performance paradigm does not even conceal his identity as an individual, much less as a human being, but the physical analogy between beetle and baritone ensures that any indignity the cockchafer suffers on stage is matched by the indignities endured by the human singer. With positions and movements rendered nearly identical by the rigging that connects them, puppetry does not serve to disconnect, but to bind two bodies together, encouraging the audience to recognise the analogous predicaments of the human singer and the insect he ventriloquises.

However, the human and beetle components of the singer-puppet system comprising the character *Melolontha* are far apart, allowing the spectator to ignore the insect-machine that seems to demand his attention. The rigging that keeps them connected and forces the strong visual identification also means that the baritone is doing identical expressive work with his body in addition to commanding the voice that is the signifier of subjectivity in opera.¹⁷⁸ The beetle no longer shares the singer's burden, but *is* the burden.

¹⁷⁷ Till, 2004.

¹⁷⁸ Corse, 2000.

iii: *Scolopendra/Anechura*

In '*Scolopendra*', two arthropod mothers come into contact as they try to raise their young. It is an insect verismo, with interactions between the centipede *Scolopendra*, the earwig *Anechura*, and their respective broods based on observation.¹⁷⁹ '*Scolopendra*' offers *Arthropoda*'s greatest challenge so far to human sympathy. Her very body repulses us.

She is a creature of genuine horror - though the danger she poses to humans is slight, from an insect perspective she is nonetheless a venomous predator whose rhetorical meaning is more closely aligned with her actual behaviours. From below, her fangs are clearly seen. Seen from the normal human perspective, she has no face. What impact *Scolopendra* has had on the European imagination is typified by this appearance of a purely rhetorical centipede in *Wuthering Heights*: 'a strange repulsive animal [...] which curiosity leads one to examine in spite of the aversion it raises'.¹⁸⁰ Compelling, repulsive, exotic, mysterious – she is an inadvertent visitor to human habitats, hiding from light when her presence is revealed, scurrying away in leggy waveform locomotion.



Figure 10: Two arthropod mothers. Left, a centipede (*Geophila* sp.), Katja Schulz, 2015; Right, an earwig (*Forficula auricularia*), Tom Oates, 2010.

The earwig mother has similarly suspicious habits. Maligned by humans for her forbidding but harmless cerci, she is a similarly vigilant guardian of her offspring.

While the role was originally intended to be the common earwig *Forficula*, delving further into the scientific literature on earwigs led me to *Anechura* and her remarkable life cycle, a chronicle of devotion, betrayal, and murder which would be easily adapted to the inflated narrative and stylistic excesses of opera.

The gruesome truth of her story is hidden behind the genteel classicisms of scientific language - 'obligate matrophagy' - and the sterile, emotionally disconnected descriptions of

¹⁷⁹ Suzuki and others, 2005; Kölliker, 2007.

¹⁸⁰ Brontë, 2008. The comparison is to Heathcliff.

her fate: ‘an unusual, self-sacrificial form of parental care in which the young eat their mother at the end of the care period [...] Hatchlings began to eat their mothers 5.1 ± 1.5 (mean \pm SD) days after hatching.’¹⁸¹

The multiple deaths that unfold before us are a necessary means to survival. One must kill and eat, or else starve. There are no innocent victims in this story – even the earwig torn apart must have devoured her own mother to have survived long enough to reproduce, only to be cannibalised in turn.

The piece defies us to identify a single protagonist among these ‘strange repulsive animals’. *Scolopendra*, title character and sole survivor, may be the villain of the piece. Even her lower tessitura makes her suspect. Yet the similar musical material given to both predator and prey, their intertwining, imitative melodies, suggest a musically and metaphorically harmonious relationship confirming an affinity, an ecological connectedness expressed not in text, but in music.

The primordial, prelinguistic emotions we are invited to share with these insects might be out of place in a theatre of mere word and gesture. Their high-stakes interactions are characterised by a peculiarly operatic combination of brutality and tenderness. This brutal behaviour is little challenge to our preconceptions of these characters, but tenderness may be harder to accept. In ‘*Scolopendra*’, music becomes an essential intersubjective tool, a means of bypassing the exterior horror of the insect body.

Conscious of ontological anthropomorphism and its corrosive effect on authenticity, I became increasingly careful over the development of the three *Life Stories* texts to restrict my use of language as the most unambiguous indicator of humanness. I started by limiting the number of words, but went on to restrict semantic, syntactic, and eventually even phonetic ranges.

¹⁸¹ Suzuki and others, 2005: 212.

The withdrawal from language is never quite completed in these pieces, but the text is ultimately reduced to a series of minimally-variant monosyllables, differing only in consonant onset. The words made thus available are serendipitously appropriate: 'Greed. Feed. Need. Bleed.' In a text consisting of syntactically unlinked, isolated interjections, it becomes impossible even to distinguish a noun from a verb, a cry for help from a command.

The image shows a musical score for a piece titled 'Scolopendra'. At the top, there is a diagrammatic representation of the vocal lines, showing various syllables like 'feed.', 'need.', 'greed.', and 'bleed.' connected by lines. Below this, the vocal parts are written for 'Forficula' and 'Scolopendra'. The 'Forficula' part has lyrics 'Let them feed' and 'Bleed'. The 'Scolopendra' part has lyrics 'what they need' and 'Feed.'. Below the vocal parts, there are four staves for a string quartet, labeled 'Str.' on the left. The music is written in a key with one sharp (F#) and a 2/4 time signature.

Example 1: segment of 'Scolopendra'

Nevertheless, they remain words, and usefully so – they drive the action forward, engaging in an affective counterpoint with the music that accompanies them. Here, the extravagant melismas, the lullaby pulse of the asymmetrical rhythm underlying the mothers' bel canto melodies, are in sharp contrast with the atonal, minimally instructed chirps and squeals of the matrophagic brood. The regularity and gentleness of the duet is interrupted by post-tonal practice, a musical idiom most suited to madness and horror. Their musical modernism is both born of and consumes their mother's romantic lyricism.

With text and setting maximally insectile, the visual presentation needn't go beyond the merely suggestive. From a practical point of view, in terms of providing the spectacle both Orpheus and *Anechura* present the same difficulty – they must continue singing while they are yet torn apart. For an arthropod, this is easier to imagine. The jointed exoskeleton for which the whole phylum is named conveniently lends itself to disarticulation, as anyone who has eaten a lobster can attest.

Brought to life as a puppet distributed among several operators, *Anechura* could easily have an Orphean moment to rival the most spellbinding of opera deaths – betrayed, murdered, torn apart, devoured, and singing all the while.

Of course, it is disingenuous to suggest that these works are purely or even authentically

animal. While the human presence may be disguised, even completely concealed, it makes itself known, unmistakably, through the voice. The selection of life stories that parallel recognisable human experience, the insect-as-human portrayal betrays human concerns, after all. Few would argue that cockchafers feel regret, or that lice worship God. But the maternal impulse felt by an earwig, carefully tending her eggs, licking them to free them of fungal infections and guarding them from predators is well-documented.¹⁸² Or if it is not a maternal instinct, what is it?¹⁸³

If these experiences resonate, it is because they are genuinely shared. The attempt at insect authenticity, however flawed or incomplete, allows a momentary dissolution of the distinction between human and non-human. Telling these stories through song acknowledges a further, musical commonality. As spectators, we are less inclined to experience the singing animal as fraudulent, because opera convention has already prepared us for such impossible intimacies.

Chapter 4: '*Sacculina*' - From Orphean to Orphic

None of the insect authenticities in *Life Stories*, embedded as they are in traditional practice and labour division, offer any departure from opera convention with regards to the relationships between composer, performer, score, and cultural context that define it. To address this, I adopted one of opera's most time-honoured strategies, trying to find a way forward by looking to the past, and to the musical magic of Marsilio Ficino in particular. He, too, was engaged in his own practice-based research, putting ideas into action.¹⁸⁴

Ficino's unparalleled knowledge of Classical thought, conveniently coupled with his close association with the era's most powerful men, confirmed his stature as one of the most influential figures in the neo-Platonist and humanist thought of the Renaissance.¹⁸⁵ Writing near the end of his life, he summarises this golden age as a historical moment which 'brought back to light those liberal disciplines that were practically extinguished: grammar, poetry, oratory, painting, sculpture, architecture, music, and the ancient singing of songs to the Orphic lyre.'¹⁸⁶

He distinguishes his Orphic hymns from both music and poetry, and gives their revival

¹⁸² Kölliker and Vancassel, 2007.

¹⁸³ The genetic reductionist stance (popularised by Richard Dawkins) suggests that we apply this question not merely to insects, but also to our own behaviours.

¹⁸⁴ Nelson (ed.), 2013.

¹⁸⁵ 'Ficino's contribution as the outstanding translator and commentator of Plato cannot be underestimated' Storey, 2003: 204.

¹⁸⁶ Voss, 2002: 227.

pride of place in his list of accomplishments. Ficino's Orphic hymns were not an exercise in the historical reconstruction of Greek lyric poetry, but central to his much grander spiritual agenda of uniting Classical and Christian theology, and 'the discovery in Neoplatonic theory of magical practice.'¹⁸⁷

Tomlinson is right to challenge the prevailing view that sees Orpheus a matter of dramaturgical convenience, a way of overcoming the misgivings of a sceptical audience.¹⁸⁸ Opera had not found its ideal subject in Orpheus – rather, Orpheus, in his continual re-emergences and resurrections, had necessitated opera.

But the Orpheus who has presided over opera's development is not the esoteric hero of Ficino's day. It is clear from the Bronzino portrait that even as early as the mid-16th century, Orpheus had become a symbol more of worldly than of spiritual power. The eager desire literally to harmonise with the universe had been supplanted by an urge to command and control it. The golden age that Monteverdi's patrons pined for was not the sublime philosophical world of Socratic Athens, but the centre of terrestrial power that was Florence under the Medici, and competition between families and cities to produce newer, more elaborate opera took over the role of Orphic Incantation.¹⁸⁹ Those earliest proto-operas were, 'in their embodiment of a still-verisimilar world of musical magic, [...] an ending, not a beginning, a final homage to the whispered incantations of the Neoplatonic universe'.¹⁹⁰ As Robert Ketterer points out, the sources, style, and ideologies of early opera are derived not from classical Greece, but imperial Rome.¹⁹¹ As captivating and enduring as the myth of opera's origins in Orphic rites and the revival of Greek tragedy may be, it remains a myth.

'*Sacculina*' is my most explicit attempt to recapture opera's beginnings in magic and ritual, following the example of Ficino, whose aim was not to revive the Orphic mysteries through accurate reconstruction, but to use Orphic means to recreate their imagined effects.

Although a number of Orphic texts are preserved, the ritual content of the Mysteries, by their very nature, remains obscure. Accounts of these rituals come to us through their detractors, such as Clement of Alexandria, who often make no distinction between the various Eastern religious traditions they sought to replace with Christianity.¹⁹² Though we

¹⁸⁷ Tomlinson, 2007: 89.

¹⁸⁸ Tomlinson, 2007: 81. This strategy is echoed by the 'backstage musicals' so beloved of Hollywood.

¹⁸⁹ Carter, 2002: 143.

¹⁹⁰ Tomlinson, 2007: 92.

¹⁹¹ Ketterer, 2003.

¹⁹² Edmonds, 2013.

cannot know exactly what happened in such rites, however, twentieth-century studies of ritual by Durkheim and Turner in particular would identify universal patterns in the social function and symbolic content of these ritual performances, with the emphasis on the crossing of boundaries, reversal of hierarchies, isolation from the circumstances of daily life, and the focussing of attention which is ‘the primary and essential factor in creating ritual effects’¹⁹³ and it was these models of ritual I sought to emulate in the design of ‘*Sacculina*’.¹⁹⁴

Just as Ficino’s magic reflected his own neo-Platonist cosmology, the content of ‘*Sacculina*’ reflects a twenty-first century understanding of humankind’s place in the world, inescapably coloured by my own biophilic priorities.

In encouraging new modes of contact between human and nonhuman, allowing for the possibility of a mystical interspecies communication, through ‘*Sacculina*’ I find myself allied with the premodern shamanist tradition and the animist viewpoint manifested in its rituals. In fact, the great number of connections between biophilia, mysticism, animism, and the shamanic paradigm has led to suggestions that these phenomena are linked at the level of neurochemistry and brain architecture.¹⁹⁵ Certainly, the ability to produce or understand the language of animals is a pervasive theme in rite and ritual, as well as a primary aim or indication of human magic.¹⁹⁶



Figure 11: Sacculina carcini – the yellow mass highlighted in the image is the externa.

¹⁹³ Marshall, 2002: 363.

¹⁹⁴ ‘for a scholar of classical culture [...] the attempt to use anthropological fieldwork as an alternative to time-travel was a choice with substantial intellectual weight behind it.’ Ridout, 2006: 119.

¹⁹⁵ Winkelman, 2015.

¹⁹⁶ See, for example, the analysis of human-dolphin encounters in Servais, 2005. Other examples range from St Francis to Dr Doolittle, themselves both telling the subject of musical drama.

Sacculina carcini is an organism of astonishing perplexity, one of nature's great mysteries. She has no common name, and her evolutionary origins are still the subject of fierce debate. Her taxonomic identity is obscured by her form, or formlessness. Like *Melolontha*, she is a metamorphic animal, whose body undergoes a series of radical transformations throughout her lifetime. Like *Pthirus*, she is a parasite, like *Scolopendra* a devoted mother.

Sacculina makes no sound, as she lacks sound-producing organs. In fact, in her mature form, she has no organs at all, save her 'externa', the only function of which is to produce eggs. The rest of her body is discarded by her free-swimming larval form upon encountering her host, a crab, through whom she insinuates herself, amorphous and fungus-like. She is no fungus, though, but a barnacle, a crustacean relative of the crab she infects.¹⁹⁷

'Infect,' however, is too simplistic a word for her relationship with her host, who is not made outwardly ill by her presence. Hers is a mimetic performance scripted by genetic code, her externa mimicking the shape and adopting the position of the host crab's natural mass of eggs. The biological sex of her host need be no impediment – should she find herself occupying the body of a male crab, she secretes such hormones as to feminise both his body and behaviour. The performance is remarkably effective, inducing the host crab to take care of *Sacculina* as single-mindedly as though she were her own, protecting and oxygenating the externa until *Sacculina*'s children hatch and swim free.

Sacculina seems especially well-adapted to the initiation ceremony's metaphorical ecosystem of bothness and betweenness. *Sacculina carcini* is a monstrous hybrid, two identities contained within a single body, destabilising even the most basic biological certainties. Like Orpheus, she is a subject in search of a form, but she is an Orpheus of a different kind, crossing the boundary not between life and death, but between interior and exterior, male and female, self and other. In short, though she lacks a voice, she remains a quintessentially operatic animal – mysterious, grotesque, extravagantly bizarre.

¹⁹⁷ Foxon, 1940.

4.1 Forced Performances

From the outside, a blank black structure, the just over human height, the proportions of a passageway, with an entrance at one end.

The interior, too, is matt black. Seaside smells of seaweed and creosote. Surf sounds which suggest that the sea is coming from all directions. The only light comes from floor level at the far end of the corridor. Just a foot or two beyond the entrance, the ceiling slants downward, until the spectator is forced to crawl through a space into the light.

Having crawled through the narrow space, the spectator stands, to find him/herself standing in a constricted space, the proportions of a wardrobe. The light comes from a tank of crabs at eye level. The tank and walls of the space are lined with mirrors, so the spectator confronts a repeated image of herself, half obscured by the crabs.

Transduction speakers embedded into the wall behind the mirrors serve as an invisible sound source. The voice of Sacculina speaks through static and surf, looped and repeated so that from both directions, her voice seems to come ever closer, from exterior to interior:

Through its very geography, ‘*Sacculina*’ blurs the line between audience and performer, making passive spectatorship impossible. It is the spectator herself who must serve as Orpheus, crossing and recrossing metaphysical boundaries, the threshold into darkness. The structure that houses the crabs, with its air of mystery, secrecy, and solemnity, sets the tone for the experience. The opening is a temptation, an invitation, even a command. Audience members do not need to be instructed to enter one at a time – the dimensions of the tunnel preclude otherwise. Immediately, spectatorship itself takes on a performative role - who will be the first to enter, or the last? Who will refuse? The comforting isolation and invisibility of the traditional audience member are unavailable.¹⁹⁸

In the presentation of the prototype, the audience spontaneously divided itself in the

¹⁹⁸ See, for example, Small, 1998, chapter 3.

surrounding exhibition space, with those having encountered *Sacculina* gathering in a group away from those who hadn't. Like a true rite of passage, '*Sacculina*' separated the experienced from the innocent, the initiate from the naive.

Unable merely to drift by, the audience member must make a public commitment to spectatorship. The gradually lowering ceiling further demands unconventional audience behaviours. The spectator must approach as they might approach a miraculous icon, on their knees in self-abasing discomfort. The physical difficulty involved in entering offers clues as to the spectator's role as pilgrim, discoverer, or trespasser, while the concealment of the inner chamber's contents heightens suspense, encouraging an intensity of looking, perhaps even priming us for a revelation.¹⁹⁹

Affinities

The atmosphere of secrecy, even in the sonically leaky prototype, extended beyond a curiosity about what might be inside, but indeed how individual spectators might be reacting. In the first of two documented encounters, a spectator already well aware of the contents of the enclosure makes haste to an unintended peep-hole at the furthest reach of



Figure 12: Voyeurism and recursive spectatorship in Sacculina.

the tunnel, just to see what happens – what this person might do.

¹⁹⁹ Although my focus is on theatre as a ritual space, the notion of space as a generator of meaning is a prominent feature of late twentieth-century performance scholarship. See, for example, Knowles, 2004; McAuley, 1999.

This voyeurism extends the individual spectator's role as a performer into a space where she does not know she is being observed. Her situation, then, becomes curiously analogous to that of the crabs, who are equally unaware that they are performing. Human and crustacean are both now broadcasting meaning about themselves to an audience hidden behind a wall, physical or phylogenetic.

While the absent parasite is the ostensible subject, the experience of spectatorship becomes an encounter with the crustacean performers. We discover that we are not crawling to supplicate ourselves before these creatures, but that we might meet them face to face. Confronted with our own image overlapping theirs in infinite regress, we struggle for some way to identify with the



Figure 13: Human fingers echo a crab's jointed limbs

other creatures in the mirror, clinging to moments of unexpected resemblance. The spectator, trapped in a chamber more suited to crab bodies than human, is not merely among them, but of them. What began as abasement has become alignment, affinity, and with them, the possibility of identification.²⁰⁰ Moving around the cramped space, we may become aware of our own stiff knees, our crab-like motions. We look into their eyes, their bubbling mouths, get as close as we dare.²⁰¹

²⁰⁰ Taussig, 1993; Turner, [n.d.].

²⁰¹ See *Sacculina*, encounter 2, in accompanying documentation.



Figure 14: 'Sacculina' reflections

Despite the intimacy afforded by our unusual proximity and lack of physical barriers, we cannot so easily overcome the intersubjective barrier that, while philosophically problematic in humans, is a practical obstacle to relations with the non-rational being. We do not know what the crabs are thinking, and could reasonably surmise that they are not thinking at all. Furthermore, we know we cannot know - the phylogenetic gulf is too great. The parallels have been forced upon us. There is no opportunity for the intersubjectivity which typifies so much of our relations with more familiar organisms, no visual recognition of a consciousness working behind the crabs' stalked eyes. It will not bond with us. We have no access through the usual channels.

Though the ostensible subject is the absent parasite, the most striking element of the piece is the presence of the crabs themselves. In their stubborn, relentless naturalness, their refusal to co-operate, they dominated the space to such an extent that they were the near-exclusive focus of comment by the first '*Sacculina*' audience.

Being upstaged by an arthropod is only one of the hazards of working with performers of a different species. As Nick Ridout points out, the appearance of non-human animals in the conventionally sterile, exclusively human space is a notorious theatrical problem, a notion the crabs in '*Sacculina*' do nothing to disprove.²⁰² In the first performance, they refused to submit to even the most basic discipline. The scraping of their carapaces against the plastics

²⁰² Ridout, 2006.

of the set added unplanned sound to the score.²⁰³ Their unruliness reached a peak as the largest of the three began spontaneously dismantling the stage itself. After knocking over part of the acrylic structure, he grasped a chunk of polystyrene in his claw and waved it about, in the process coming so precariously close to the edge that one audience member volunteered to intervene.

These carnival misbehaviours are not, however, the distractions that Ridout finds most problematic. The real issues stem not from the animals but from their appearance alongside human performers, and the inevitable comparisons drawn.

Animals bring unwanted attention to the falseness of the performance, challenging the audience's suspension of disbelief. Living animals are corrosive to theatrical illusion, because we are aware that they are not acting. The audience member confronted with a disruptive animal presence becomes suddenly, painfully aware of the entire theatrical apparatus and their own role in it. The ambiguity between performer and spectator in '*Sacculina*' further complicates the issue. Do the crabs make the human spectator more or less self-aware? Does asking 'what are the crabs doing here' invite further speculation about what we as fellow participants are doing here? Are the human participants implicated in the crabs' undoubtedly bleak fate?²⁰⁴

The crabs, though they lack complete freedom, do retain a certain agency. Their unruliness, in fact, points to an enviable lack of constraint in comparison to the human spectator, who must deduce and then obey an implied set of rules, follow an unspecified script, all the while plagued by doubts over what the whole experience might mean.

In the wild, or in the eco-mimetic space of a zoo or aquarium, the crabs can be merely seen rather than interpreted.²⁰⁵ Whatever behaviours they display in such contexts, we do not instinctively ask ourselves what such crabs might mean. In '*Sacculina*', however, we cannot help ourselves. Despite its unconventional architecture, the space that the crabs occupy clearly serves as a stage. The animal is not merely present, but recontextualised by human performance, operating as part of a semantic system to which it has no access.

Transformed by context into unwitting participants in a performance, the crabs become objects of particular scrutiny, signs cut adrift from any obvious referent. Nonetheless, they remain completely unaware of their transformation from 'real' crabs into 'stage' crabs. Such meaning as they might seem to generate – metaphorical, affective, purely cognitive –

²⁰³ *Sacculina*, Encounter 2

²⁰⁴ Peterson, 2007.

²⁰⁵ Although zoos may also serve as sites of interspecies communion. See Silva, 2005.

is entirely illusory. They have no meaning, but they must somehow be made sense of.

4.2 *Crustacean meanings*

The lack of a human body as expressive object severely limits the channels of information available between subject and spectator. Vocal apparatus, gesture, and facial expression are all missing. Given these insuperable, innate physical and sensory incompatibilities, the piece tackles the problem of communicating to its human audience by that most operative of techniques, reducing the unshowable, the supernatural, to a disembodied voice from an offstage which surrounds us. This is not to duck the thorny problem of visual representation – her uncanny presence is an element of realism. *Sacculina* herself is literally disembodied, indeed references her bodilessness in the text she sings. Voice is all that remains of the human singer who acts as shamanic mediator – she has taken on the form of *Sacculina* so completely that she, too, is completely discorporeal.

Admittedly, the act of narration itself is beyond the expressive faculties of the voiceless, brainless, bodiless *Sacculina*. This is intended not to deny her non-linguistic animal nature, but function instead as a translation into human communication of otherwise inexplicable behaviour. As in the previous miniatures, in conscious avoidance of so-called ‘trivial’ anthropomorphism²⁰⁶, the text is made almost entirely of observable, verifiable facts about *Sacculina* as a biological entity, a physical organism. Between humans, such a text would be a signifier of madness or obsession, with its images of shared blood and body. Sung by *Sacculina*, these surreal metaphors become a literal truth.

SACCULINA:
ceremonially, soothingly, sotto voce, with a stately rhythm:

i have no body but you are my body.
no body but the roots you feed me through
i have no shelter but you are my shelter
you my provider
i am inside you i
you am inside i you i we
you have no blood but what we share
what pulses through me you she i
can you feel me
can you feed me
you me i breathe and feed my our your fill of me
no oxygen but what oxygen breathes through you
i am that will

²⁰⁶ Simons, 2001.

i am that need
 i am the source of that hunger
 you will not mate
 you will not moult
 you will not grow as i will grow
 you will accept me as of you
 you who were mother now are mother to her our my brood i
 you who were cock crab bent to my rhizocephalan will
 cock crab bent to my will
 gynecomorphically
 your blood my blood
 my sex your sex
 bent to my will
 i you we have no will
 we i have no soul you
 each armoured limb succumbs and i move you
 you i she move we move her you
 she i you we us me thee
 her my your our thee thine

I was careful to have *Sacculina* remind us that she has no soul, that she has no will, lest we be tempted to ascribe any higher cognitive function to this most reduced of parasites.

Despite her miraculous or uncanny ability to narrate her own story, or at least describe her condition, she remains a purely Cartesian animal. Like the idealised opera singer, she does not think, but merely sings. Her emotions, such as they are, are the primordial urges shared by all sexually reproducing animals.²⁰⁷

Her text deliberately avoids any expressions of motivation. There is no mention of what *Sacculina* wants, or why – the parasite has no desire, merely behaviour. *Sacculina*, the manipulator of her host's biology to satisfy her own reproductive needs, is herself the puppet of instinct and Darwinian imperative. Her invocation of 'will' is qualified as 'rhizocephalan', and subsequently disavowed as she searches for a pronoun adequate to her composite subjectivity.

The strange beauty of the word 'rhizocephalan' supports Welsh poet laureate Gillian Clarke's assertion that 'precise use of language is conducive to both science and poetry.'²⁰⁸ Yet precision does not guarantee communication. The text can make denotative sense only in the light of what prior knowledge the participant has of *Sacculina* herself. With specific knowledge of rhizocephalan life cycles, the hallucinatory images of shared blood and shared body words sung by *Sacculina* become an evocative but tangled mass of pronouns – and the riddle they contain left unsolved by an impatient audience member.

²⁰⁷ Denton, 2006.

²⁰⁸ *Book Club*, 5 May 2013.

Lacking prior knowledge of *Sacculina*, we are almost certain to attribute (mistakenly) this ever-descending choir of voices to the crabs, as the only other occupants of the chamber. With no clues but the sourceless voices directed at an unidentified 'you', we could convincingly cast the crab as uncanny parasite and ourselves as innocent victims. Indeed, a crab is readily identified with its Latin name, Cancer, due to the constellation's fortuitous position on the ecliptic, and the imagery of the invaded body, the co-opted self, which pervades her text would certainly support such a reading.²⁰⁹ The shifting pronouns further emphasise the ambiguity of address: it is an ambiguity of identity, a disregard for the distinction between self and other with which she relates to her own colonising body.

In a sense, then, the crustaceans are a red herring. The only source of propositional meaning in the piece refers to an organism who is not even present, represented by the voice of an equally absent singer, who herself declaimed the text without any knowledge of the character to whom she was lending her voice.²¹⁰ The crabs are on display, even performing, but they are not acting.²¹¹ The elaborate set-up declares the experience to be meaningful without offering any useful hint as to what that meaning might be. Any drama they may take part in is only a by-product of the staged interspecies encounter, in which all participants play themselves. This non-mimetic performance evades the problem of drama, bringing the experience into the realm of the post-dramatic.²¹²

4.3 *Why do crabs sing?*

Sacculina makes a habit, an entire lifestyle, of bodily transformations at the frontier of the human imagination. She erases the distinction between genders. She is literally disembodied, yet physically present. She manipulates her host from within, co-opting his most basic vital functions, without coercion, without violence, releasing her host from agency. There are countless echoes of her phenotype in the opera process itself: She is the score that compels the song, the song that drives the voice. *Sacculina* is voice herself, an invitation and a warning to the singer she will enthrall; the voice that fascinates, seduces, captivates an audience whose bodies willingly submit to such control.

Although the purpose-built structure in which this encounter takes place is surely no opera

²⁰⁹ The Rohrshach-test quality of a situation engineered to be laden with evident but inscrutable meaning lends itself to a plethora of equally plausible 'wrong answers'. *Sacculina*'s message is uncannily (though unintentionally) similar to the Annunciation, a theme to which I have repeatedly returned in my own work.

²¹⁰ *Sacculina* was voiced by soprano Kat Carson.

²¹¹ Kirby, 1972.

²¹² Lehmann, 2006: 99–104.

house, this does not preclude the piece from supplying an operatic experience. The listener is privileged with access to an otherwise inaccessible conversation between two non-humans, themselves communicating across the species barrier. It is fitting that *Sacculina* should conduct this mystical conversation not through speech, but through song. It is singing which allows the experience of the piece to cross the epistemological divide from science into art or religion – music is serving the metaphysical function of Ficino’s experiments, or of ritual everywhere.²¹³

The music serves another traditional function, colouring the sung word with its ineffable meaning. Here, the music offers no clue to resolve textual ambiguities, no cadence to signal to the participant that the experience has finished. The declamatory tone of a speaking voice, pitch-shifted into triads with no key centre, supplies no affective truth to guide our experience towards the aesthetic, the intellectual, or the religious; the terrifying, or the transcendent.

Although cyclical harmonic or melodic patterns are commonly used to evoke the experience of time in the nature²¹⁴, the voice in ‘*Sacculina*’ is digitally manipulated, its ranges of both pitch and dynamics extended to allow this pattern to continue beyond the realms of the natural. This subverts the conventional function of opera’s accompanying orchestra to supply physical gesture.²¹⁵ The gesture of perpetual descent described by the melodic and harmonic motion is impossible, or else taking place in an impossible environment, like an Escher staircase.



Figure 15: 'Sacculina' chord progression

The puzzling but potentially evocative absence of *Sacculina* herself from the piece was by accident rather than design, as my attempts to source genuinely infected crabs were beset with logistical and bioethical difficulties. I briefly considered prosthetic externae, but these seemed at best unnecessary; at worst, kitsch or deceptive. This is just one of a number of

²¹³ Lewis, [n.d.]: 49–61.

²¹⁴ Josephson, 1995: 406–8.

²¹⁵ 'Too much acting distracts from [opera's] essentially musical nature. A wise Providence has substituted musical 'gesture' for physical gesture in the world of opera in the form of the expressive opera orchestra.' Kivy, 1991: 75–76.

sometimes serendipitous material compromises involved in the construction and exhibition of the prototype. In fact, hardly a line of the performance text is adhered to.

The passageway was narrower than specified in the plans, and the final chamber could not be constructed robustly at the right height. Both of these seeming errors, however, had unexpected benefits in the way they guided the spectator's movements. The narrow passageway precluded a spectator from simply turning around, and the low ceiling brought the final chamber into a scale more comfortable for the crabs than a human. The awkwardly bent limbs and scuttling motion thus required of the audience member offered further opportunities for the recognition of physical identification. The white polystyrene, too, echoed the box that crabs had travelled in, underlining a sense that the human spectator was a visitor to crustacean space. The mimetic gesture of seaweed and creosote seemed no longer in keeping with the visually sterile interior, but this extra sensory dimension was supplied by the smell of the crabs themselves. Such constraints confirm that the experience of the operatic need not rely on elaborate, expensive spectacle which makes participation unnecessarily exclusive.

The material shortcomings in terms of the sound design were less fortuitous. With induction speakers supplying sound to the stage floor instead of the walls, the directionality and implied inward motion of the voices were lost. Perhaps crucially, the lack of clear stereo positioning also rendered the words nearly unintelligible, denying the spectator any source of referential meaning, the voice obfuscating what it was meant to clarify.

This may, in hindsight, be a benefit. The production of linguistic meaning, meaning found through analysis rather than experience, is emphasised by Carolyn Abbate as potentially destructive to the experience of music itself, that 'dissecting the work's technical features or saying what it represents reflects the wish not to be transported by the state that the performance has engendered in us.'²¹⁶

The conditions for encounter in '*Sacculina*' are staged but the encounter itself unscripted. The non-linguistic nature of the animal performer means that what 'happens' may even be impossible to write down. Its meaning is only revealed through performance. Whatever our interpretation of the text, the geography forces identification with the crab, not through mind and speech, nor even music, but through body and behaviour.

While there is always a danger of overapplying what Mary Douglas calls 'the most convenient of binaries'²¹⁷ – human vs. animal – it seems clear that the distinction between

²¹⁶ Abbate, 2004: 505–6.

²¹⁷ in Fudge, 2004: 24. Donna Haraway also warns against these easy dichotomies. Haraway, 1991.

the gnostic and drastic strategies of understanding music, between knowing and doing, mind and body, maps onto human-animal difference in more than metaphorical ways.²¹⁸

The crabs, as Ridout could have warned, so comprehensively stole the show that my own contributions, the elements of music and text that define opera as a form, may have done little more than provide a sonic and physical environment for an interspecies encounter entirely beyond my control. But the shift of focus away from the score and libretto to the lived experience of the performance marked a transition in my own work from operatic to post-operatic practice, a shift demanded and enabled by the presence of the non-human.

²¹⁸ Williams, 2009.

Chapter 5: Tettix

5.1 *The failures of Orpheus*

In *Sacculina*, representing a radically Other being through operatic means (the singing voice in performance) demanded a reconsideration of some of opera's fossilised conventions, including the limits of my own role as a composer.

I was satisfied that *Sacculina* supplied some essential elements of the operatic experience, even if these elements were largely provided by the organism herself and her inherent strangeness as much as my own contribution. Yet while *Sacculina* may be an extreme case, she is representative of my own experience of arthropods, who provide a source of fascination that requires no fictional embellishment. Arthropod lives may answer Rousseau's call for non-mythical subjects and realistic representation while still supplying the prerequisite magic.

Restoring the magic to a disenchanted form has traditionally been the role of Orpheus²¹⁹ – a tradition I deliberately appealed to in *Sacculina*, not realising that still left the question of which Orpheus. Even Classical Orphic religion recognises two as authentic, distinguished by their contribution to the rites: Orpheus the mythological hero and Orpheus the poet.²²⁰ Though it was the Orphic text that captured Ficino's imagination, I thought the other Orpheus – not the one who wrote the lament, but who performed it among the assembled beasts – might have more to offer to a performance-oriented compositional practice. On closer examination, Orpheus's heroic status is not so obvious.

The story of Orpheus is ultimately not one of triumph over death but of a tragic, all too human lack of self-control. Given a single injunction, not to look back at Eurydice until they have reached the land of the living, he fails. Orpheus proves an unlikely standard-bearer for the Enlightenment virtues of reason, order, moderation, and restraint.

A wider look at the opera event shows us that Orpheus is working his Apollonian magic: in the face of the most tumultuous emotions, the most miraculous transformations, the obedient audience remain hushed and reverent, silenced animals all. It took centuries for opera to reach this Orphean ideal, but Western art music came to define itself with this civilising (that is to say, sterilising) ritual, a well-trained audience following instructions no less intently than the performers, who are duty bound to submit themselves to the literal authority of the composer as set down in the written score.

²¹⁹ Chua, 2001: 25–26; Butt, 2005: 50.

²²⁰ Edmonds, 2013.

If this is where Orpheus has led, perhaps we could benefit from a different guide.

5.2 *Eunomos*

I am not the first to propose Eunomos as an alternative to Orpheus. Clement of Alexandria, in his *Exhortation to the Heathen*, challenges those who still celebrate the Orphic mysteries to defend their beliefs.

"How," he asks, "have you believed vain fables and supposed animals to be charmed by music?"²²¹ It is not the fiction, however, of these fables that causes him such concern.²²² He freely admits being 'pained at such calamities as form the subjects of tragedy, though but myths.'²²³ What troubles him most is the way the fiction blinds us to the endless sources of wonder that already surround us. Eunomos is offered as a more plausible, spiritually healthy alternative.

Unlike Orpheus, we know of Eunomos from only one episode. At the Pythian games, while singing a song commemorating the death of the snake Python, Eunomos breaks a string of his lyre. His song is saved through the intercession of a cicada, who helpfully lands on his instrument and sings to supply the missing note and secure victory for Eunomos.

Clement's praise of Eunomos, couched though it may be in a Christian theological framework, was addressed to pagans, and reflects a pantheist-animist understanding of the natural world that would not seem out of place in contemporary biopolitics. His objection to Orpheus, like mine, is a challenge to an anthropocentric world view played out in his interspecies musical interactions – a challenge followed by a call to wonder.

While for Clement, it is the cicada as evidence of God's creation that deserves our attention, provokes our awe, those who do not share his Christianising agenda can marvel at the cicada itself – a serendipitous musical collaborator, whose motives are unknowable, and whose behaviours at once disrupt and rescue Eunomos's performance.

Eunomos's cicada duet is not just a drama, but a drama per musica – just as in Orpheus, music-making has a central place in the narrative. Given that the cicada's essential contribution is its sound, perhaps following the Eunomic model is as simple as adopting

²²¹ Roberts and others (eds), 1885.

²²² Nor, indeed, the 'supposed animals' – Clement takes a well-established rationalist position regarding Orpheus the Beast-Tamer, interpreting the beasts (as did Horace, Aquinas, and Dante, among others) as allegorical representations of human animality or animal humans, rendered unthreatening by the fruits of civilisation. See Boynton, 1999: 49–50.

²²³ Roberts and others, 1885.

insect music, with all the formal and aesthetic choices that might imply – redrawing the boundaries between music and noise, for example, or adopting minimalist textures or non-telic forms. But the real magic in their interspecies concert lies outside the sound, in the interactions and relationships compelled by the performance.

5.3 *Eunomic principles*

A search for a Eunomic performance finds a music-making event in which the Orphean distinction between roles of composer, performer, and audience cannot apply. Similarly, as a model of animal-human relations, the example of Eunomos's cicada stands in sharp contrast to Orpheus's unnaturally silenced animal audience – confirmation that musical performance can both contribute to and benefit from a repositioning of the human subject with respect to non-human nature.

When the cicada landed on Eunomos's lyre, he²²⁴ turned a solo performance into a collaborative effort. While collaboration is certainly nothing new to musicians, the emphasis on the soloist has a particular importance in the development of opera. The birth of the genre is clearly marked by the emergence of the solo voice, the individual subject, from the polyphonic textures of the Renaissance. Although Eunomos and his nameless insect partner may lack some the glamour of Orpheus (or the other demigod divas who would follow his example), new patterns of musical and social interaction are made available through the more collaborative model. Eighteenth century opera was so in thrall to the star singer that even duets were uncommon, and choruses a rarity. Even now, critical consideration of the opera voice focusses nearly exclusively on the soloist.

Parallel to this development in performance is the establishment of the 'creative genius' model of the composer, of whom Orpheus is a prime example. His musical talents mark him out as extraordinary even in the company of demigods – his role in the quest for the Golden Fleece is even more essential than Jason's.²²⁵ Obsessed with his own internal turmoil, he does not so much communicate with his music as express, magically silencing all within earshot so they might share his anguish.

Deference to the genius composer has also been transferred to the object through which he communicates. Gunther Schuller's advice to conductors is symptomatic. 'It takes tremendous discipline and conscience to evolve an interpretation that is faithful to the specifics of the score,' he cautions. Such an interpretation, he says, 'illuminates the score to

²²⁴ Only male cicadas sing.

²²⁵ At least, according to the *Argonautika*. Apollonius, 1997.

the fullest; it does not alter it or distort it. And the conductor's personality is not substituted for that of the composer.' Great composers, he continues, were 'meticulous, precise notators of their music [...] In the scores of the great masters – and even the minor masters – there is much more that is precise, accurate, clear, and objective, and therefore to be trusted, than there is vague and undetermined.'²²⁶

I share Clement's suspicions of the top-down, rule-governed tradition in which the freedom, natural purpose, and expressivity of the performer is secondary to the rigour of the score. For him, the cicada's song is superior because it follows its own rules – αὐτόνομος. To drive the point home, the word he uses for Eunomos's song is not the unambiguously musical ἀοιδή of the cicada, but νόμος – an ordinance or law.

Schuller's comments make it clear that the connection between notation and law is more than etymological coincidence. Following the score is not the means to an effective performance, but an end in itself, even a moral imperative; a matter not of taste, but of conscience, faith, and respect. Conversely, only the composer who is meticulous and precise in the manner of his notation can aspire to greatness, or even be trusted. Such score fetishism has led to a performance culture in which 'trained musicians are often uncomfortable about making choices,' as Elaine Gould warns in her 2011 guide to notation.²²⁷ Eunomos's cicada, on the other hand, is clearly making its own choices, as Clement is eager to point out: 'But of its own accord it flew to the lyre, and of its own accord sang.'²²⁸

Given the great success of the concert, it might be easy to succumb to biophilic sentimentality and forget that the cicada is not an invited participant, but a transgressor onto the performance space. How might the well-trained, uncomfortable musicians of today, under the thrall of the Orphean model, react to an animal that refused to stay silent? And how might a culture that prizes displays of virtuosity value the humble contribution of an insect? The cicada crossed the barrier between audience and performer, and his lack of technical prowess was no bar to his participation. The single note he was able to provide was indispensable. The collaborative spontaneity guides Eunomos and the cicada as performers, but extends to the audience as well.

In refocussing our attention from the sound to the context of its making, Eunomos urges us past not just the boundaries of the traditional score, but the elaborate practices, on-stage

²²⁶ Schuller, 1998: 25–26.

²²⁷ Gould, 2011.

²²⁸ Roberts and others, 1885.

and off, which have grown up around it. The archetypal Orphean scene establishes a familiar performance paradigm, setting clear boundaries and patterns of behaviour which are overturned by the unruly *Tettix* of Eunomos's story.

Laurie Anderson recounts her own Eunomic episode in *The End of the Moon*, recalling 'Life does not get better than this – I'm singing a song, a duet, with an owl.'²²⁹ David Rothenberg does not wait, instead bringing himself and his saxophone into cicada spaces, joining in with an already present cicada music.²³⁰ For both performers, the nonlinguistic intimacies they share as musicians make the divide between species momentarily bridgeable, even across the widest phylogenetic gulfs. Considering these moments from an insect's perspective, we are reminded that the nonhuman world has its own reasons for singing, and we, too, are frequent trespassers into performances not our own.

5.4 *The Classical cicada*

We might be surprised today at the praise heaped on cicada singing by the Greeks, more likely to be struck by the quasi-musical condition of their call – insistent, noisy, and percussive – considering them strident and raucous, as did the less sentimental Romans.²³¹ Incredulity over Homer's description of cicada song as "lily-like" has led commentators to doubt their understanding of Homeric Greek, rather than reconsider their own learnt musical tastes.²³²

Perhaps they should heed Plato, speaking through Socrates, as he urges the young Phaedrus to behave well in the presence of cicadas. By impressing the cicadas, we might convince the muses to 'respect us and give us that gift which they have from the gods to give to men.'²³³ He admires them not so much for the quality of their music but their commitment to the song.

...cicadas were once men, belonging to a time before the Muses were born, and that with the birth of the Muses and the appearance of song²³⁴ some of the men of the time were so unhinged by pleasure that in their singing they neglected to eat and drink, and failed to notice that they had died; from them the race of cicadas was afterwards born, with this gift from the Muses, that from their birth they have no need of

²²⁹ Anderson, 2005.

²³⁰ Rothenberg, 2013.

²³¹ Davies and Kathirithamby, 1986.

²³² Egan, [n.d.].

²³³ in Ferrari, 1987.

²³⁴ Again, here the word *ᾠοιδή* is used to emphasise the naturalness of the song.

sustenance, but immediately sing, without food or drink, until they die.²³⁵

Opera need not fear losing its Olympian (or more properly, Heliconian) connections by adopting the slightly less glamorous Eunomic model. The cicada, too, can pass freely between the realms of gods and humans, and bears the same divine endorsement as Orpheus. The cicada can even lay claim to the Orphic triumph over life and death. The yearly emergence of the ghost-white larvae from beneath the earth made the cicada a common emblem of resurrection. The connotations of cicada song in *Phaedrus* are shared with opera as well: ‘poetry, eros, and immortality.’²³⁶

Socrates tells the story of the cicadas as a cautionary tale, discomfited by *Phaedrus* admitting to wonder. Though he praises the cicadas, he warns *Phaedrus* not to be seduced by their song, comparing them to the Sirens. They must choose between two distinct options: ‘either we will become bewitched by the cicada-song and nap, or we will sail past the Siren-like insects and engage in philosophical dialogue.’ Though wise, Socrates cannot see the third option – succumb to their magic, and join their song.

5.5 *Tettix*

Eunomos’s cicada integrated itself spontaneously with human technology, allowing itself to function as part of a cyborg instrument: literally a breathing lyre. But the cicada’s body is also a musical instrument in its own right. The remarkable voice²³⁷ of the cicada is the result of an embodied dedication to singing, just as Plato suggests. Half of the cicada’s body is taken over with a resonating air chamber, and he devotes as much of his inner musculature to singing as to flight.²³⁸ We can go beyond the poetic or narrative mimesis of a libretto or the musical mimesis of a score – by examining the cicada’s singing body directly, rather than the sound or meaning it might produce, we can adopt a traditionally biomimetic approach in creating a sound object for use in performance.

Such an object is the *Tettix*, which takes its name from the Greek for cicada. Until the twentieth century, entomological discussion of cicada sound was only conjectural. Even though the components of a cicada’s sonic anatomy had been identified, their role in sound production remained unclear.

Insects are variously referred to as drummers, singers, or instrumentalists, regardless of the

²³⁵ In Ferrari, 1987.

²³⁶ Ferrari, 1987: 137.

²³⁷ Technically a misnomer, as insects rarely make vocal sounds, which depend on an airstream.

²³⁸ Simmons and Young, 1978.

manner of their sound production, and this anthropocentric bias may have contributed to the long mystery surrounding cicada sound. The cicada system does not fit neatly into our standard system of instrument classification,²³⁹ due in part to its method of introducing acoustic energy into the system, by means of ‘buckling’ a rigid chitinous structure called a tymbal.²⁴⁰ A further structure, the acoustically transparent tympanum, functions as the main sonic aperture of the body. The sound is further refined through the opening and closing of opercula, which can affect the amplitude.

Recent bioacoustic studies, particularly by Bennet-Clark and Young, have revealed much of the workings of the cicada sound production system,²⁴¹ which is such an efficient example of acoustic engineering that it has attracted the attention of the US Navy.²⁴²

The sound produced by a single click of the tymbal is loud, but decays very quickly. The cicada overcomes this limitation with a series of buckling ribs that contract in sequence, timed so that the sound of each click is boosted by its successors. This method of producing a lasting tone has the added benefit (to human ears) of buckling the tymbal at frequencies within the human-audible range – an action that accounts for the dyadic nature of cicada song as well as the siren-like glissando at the beginning of long cicada calls as they literally warm up.²⁴³

Bennet-Clark and Young created their own ‘cicada synthesiser’, an electromechanical model of this system,²⁴⁴ which was subsequently used in the production of a remarkable electronic interface called the Tymbalimba. Its creators, musician-engineers Julius Smith and Tamara Smyth, were drawn to the cicada both by the novelty of its mechanism and its ability to produce sustained tones with an intermittent input of energy.²⁴⁵

Although their instrument would contribute to the production of cicada sound, the Tymbalimba itself is an electronic interface. Through precision engineering, they were able to reproduce the ‘cicada’s efficient buckling mechanism’ in a form that would be useful to a human player, with the mechanical energy thereby produce harnessed as a signal source for the Clark-Bennet and Young cicada synthesiser.

²³⁹ MIMO Consortium 2011.

²⁴⁰ A phenomenon familiar from the pop-up lids of jars that are used to confirm the integrity of its seal, and the handheld clickers used in dog training and the Catholic mass. See Pierce and others, 2013; Young and Bennet-Clark, 1995.

²⁴¹ Bennet-Clark and Young, 1992; Bennet-Clark, 1997.

²⁴² ‘Secrets of the Cicada’s Sound’ 2013.

²⁴³ Ossiannilsson, 1949: 107–16.

²⁴⁴ Bennet-Clark and Young, 1992. □□

²⁴⁵ Smyth and Smith, 2003.

All imitation of nature is necessarily a simplification, a compromise struck between fidelity of reproduction and available means, guided by the priorities of the artist. These priorities will reflect (or expose, establish) an evaluative framework by which some features of the imitated object are deemed inessential.

The slick appearance of the Tymbalimba is a reflection of its origins in abstraction and mathematical modelling. This reductionist approach bypasses behaviour and biology in favour of physics. Though the cicada's sound is thereby reproduced, cicada music is still somehow lacking. The electronic interface is used to trigger a computer synthesis model cicada song, thus outsourcing the mimetic labour to machines, as well as further distancing the player from the instrument's insect model.

Like Vaucanson's duck or the Emperor's music box, the Tymbalimba follows Voltaire's injunction to improve nature by stripping it down to its quantifiable essential. We marvel at the ingenuity of the inventors, leaving us free to ignore the creature being imitated in favour of its mechanically reproduced sound.

The Tymbalimba is a remarkable creation, and the Tettix cannot be said to be an improvement on it. Instead, the two instruments reflect the different mimetic priorities of their designers. Even the names they are given help to distinguish the two approaches. Tymbalimba is a portmanteau word that combines the cicada's buckling mechanism, the tymbal, with the human marimba. The Tettix, on the other hand, has been named after the cicada itself. Where the Tymbalimba imitated sound through electronic abstraction, I sought to reconstruct the physical system that produced it.²⁴⁶ This meant building an acoustic instrument, using mechanical energy directly rather than mediating electronically between the player and the sound produced.

Beneath the finely-tuned specialist structures, the cicada is a simple Helmholtz resonator. Of course, I would retain the buckling mechanism, both as a unique feature of cicada sound and as a source of pleasure or engagement for the player.

My early attempts to mimic the cicada as auto-instrumentalist focussed on the mechanism by which the buckling might take place as frequently as possible, in imitation of the action of the cicada muscles, refining the buckling mechanism – a custom-made three-stage

²⁴⁶ This parallels a similar strategy adopted by Simon Penny in his own 'physically instantiated, physiologically inspired' *Phatus*, or Hideyuki Sawada's KTR-2, physical models of the human vocal apparatus that follow the Vaucanson tradition by deliberately avoid the seductive fidelity of available digital models, such as the 'Vocaloid' pop star, Hatsune Miku. See Penny, 2011; Bell, 2015; Bijsterveld, 2009.

buckling made the instrument expensive, necessitating the use of machines. All these separated the human player from the haptic response of the buckling action which is so satisfying, although one in particular, an improbable bicycle-based contraption, had the advantage of reminding us that for the cicada, as for the opera singer, the act of singing is highly athletic.²⁴⁷

My first trials of the Tettix made clear why the buckling mechanism seemed so underutilised in human musical instruments. The rigidity of material required to buckle meant that the clicking sound produced has a high frequency spectrum. This is perfect for cicadas, whose sound world intersects our own only at their lowest ranges, but tended to overpower the sound of the column of air, tuned for human ears. This problem is aggravated by the fact that not all of the sound of the click is channelled through the body of the instrument, but is free to radiate through the open air behind the buckling membrane. A foam disc applied to the playing surface proved a reasonable compromise between simplicity of construction and purity of tone.

Most cicadas boost their volume by adjusting the click frequency to match the resonant frequency of the tympanum or the chamber in their abdomen. This is functionally equivalent to the reed or mouthpiece on brass and wind instruments, which vibrate in sympathy with the frequency of the column of air within the instrument, resulting in a pure tone of significantly greater amplitude.²⁴⁸

The sound of a single click is too high for human hearing, but the frequency of clicks required to reach audible range is still too fast for us to produce. I had to concede, as did Smyth and Smith, that the human body is an inadequate means of reproducing insect sound.²⁴⁹ The Tettix produced a charming, clearly pitched plosive ‘pop’ that was not loud enough to be musically useful, nor were humans agile enough to turn the single pop into a sustained note. An acknowledgement of human inadequacy is not, however, an admission of failure. These potentially fatal flaws in acoustic cicadamimesis were easily solved by reorienting focus from cicada sound to cicada singing.

Their finely-tuned tymbala certainly contributes to the cicadas’ continuous tone, but we hear this sustained tone in large part because cicadas do not sing alone. The rather feeble

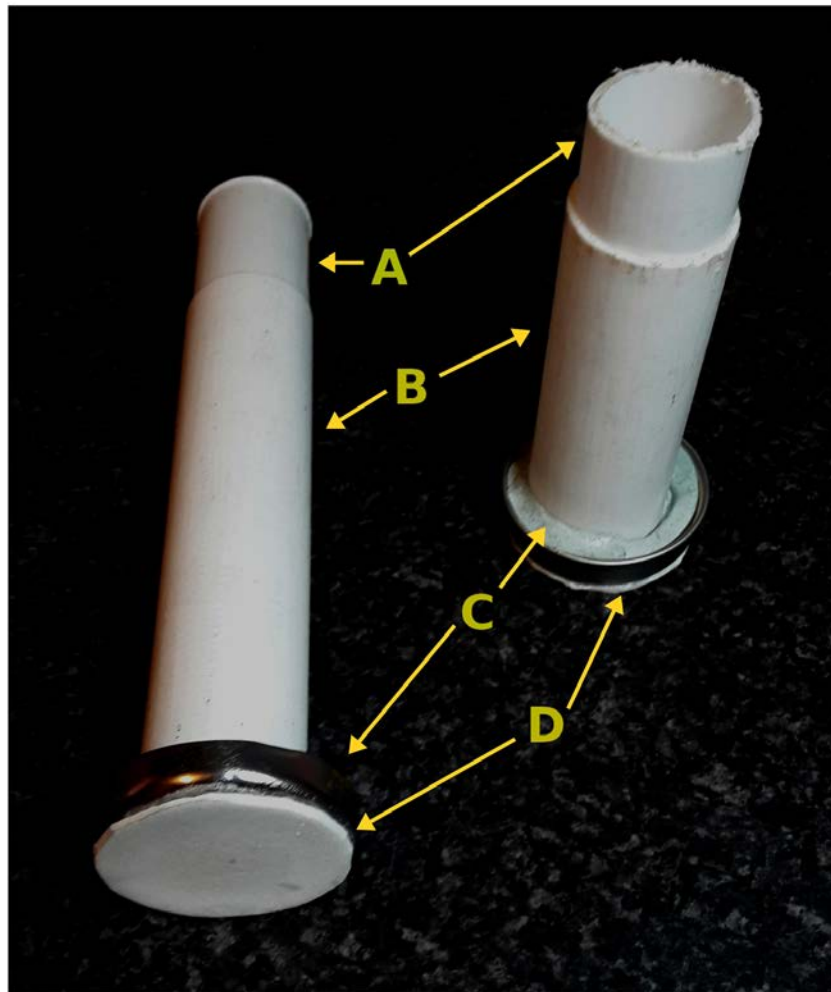
²⁴⁷ Alexander, 1962.

²⁴⁸ Evolution has taken *Magicalicada* closer to the human model – a flexible tymbal membrane allows a similar sympathetic resonance, enabling the cicada to produce ‘pure tones’ with only one fundamental frequency rather than the often dissonant intervals typical of cicada song. Young and Josephson, 1983.

²⁴⁹ Smyth and Smith J O, 2002.

solo Tettix suddenly makes sense as an expressive instrument when accompanying insect music-making and social behaviours, taking advantage of the otherworldly properties of mass sound.²⁵⁰

An instrument whose performance practice depends on large ensembles and the production of mass sound must be materially and technically accessible. The design could be refined in



*Figure 16: The Tettix. A and B, nested plastic tubes;
C, sealant; D, clicking membrane with felt damper*

many ways but the Tettix has no pretensions towards refinement. The Tettix has the advantage of being cheap and simple to produce. The materials for its construction are readily available, and it is impossible to play a Tettix wrong.

The first trial of the Tettix proved surprisingly successful.²⁵¹ The Tettix has an oddly

²⁵⁰ The term 'mass sound' is conventionally associated with avant-garde electronic composition.

²⁵¹ See 'Tettix workshop' in the accompanying documentation.

compelling mechanism, a transparent equivalence between haptic and sonic response, and a playing gesture that seems to beg repetition. The small audience of trained musicians and non-musicians alike needed no prompting or instruction to make sounds with the Tettix, nor to make sounds with it in different ways, often using the affordance of the nested tube mechanism to adjust the pitch. The primitive materials, the primitive mechanism, the very obviousness of it make playing the Tettix and playing with the Tettix one and the same.

The perceptible analogy between player's gesture and instrument's sound was lost due to the small motion required to play, but there was some visible connection between sound and image in the sizes of the instrument.

There is considerable room for timbral difference, especially in the largest bass and baritone instruments, but pitches in the larger instruments are not adjustable. In the consort of Tettixes I constructed, the instruments were tuned to a scale made of the set of pitches of three major triads a major third apart, allowing an infinitely ascending harmonic sequence, a similar musical gesture to that in '*Sacculina*'.

The athleticism I had sought in much more elaborate models proved to be present in playing the simpler Tettix as well, so they might be used, as in the singing insect or the tenor's high C, as a display of physical prowess. The size and weight of the bass and contrabass made playing the Tettix physically impossible except for the taller members of the ensemble. Even the hand-held soprano Tettix offered a challenge to the endurance of the thumbs.

The piece I wrote to demonstrate the Tettix in insect opera is *Brood*, based on the emergence of the cicada *Magicicada septendecim* in biblical proportions every seventeen years. The name of the genus is testament to its place in the canon of natural wonders. Nearly at once, millions of cicada larvae climb up trees and walls, shed their final adolescent layer and emerge fully winged. The loud, slow-moving adults crowd every tree, cover every surface for a few weeks and they are gone again, eggs laid, silent bodies scattered on lawns and sidewalks.

An interior space and time are designated. The space should have high ceilings, and ideally a way for performers to ascend without inordinate effort from one level to the next. Ladders, poles, or other ad hoc structures may be used. Performers ascend the space according to instructions. Rehearsal may be used to familiarise performers with the space and use of instruments but not as a way of finalising the outcome. A shifting arrangement of structures/levels may be conducive to this.

Sound sources: Tettixes of various sizes, human voices.

Text: Light. Higher. Climb.

Fine. Bright. Alive.

The performers repeat this action seventeen years later.

Instructions for individual performers:

1. At the designated time, arrive in the vicinity of the designated place.
2. Playing your Tettix continuously, enter the space and ascend to the highest place you can.
 - While you ascend, sing these three words:
 - Light. Higher. Climb.

Each syllable is sustained as long as you can on a single breath, except the first syllable of 'higher'.

Every syllable is pitched higher than the previous syllable.
 - Repeat step 2 until you can go up no further.
3. Hold the 'm' of climb on the same pitch until all of the performers have climbed as high as they can.
4. Allow the sound of your voice and your Tettix to fade away.
5. At the same time on the same date seventeen years later, arrive in the vicinity of the designated place.
6. Repeat from step 2.

Designs were made for various combinations of entrances and exits so that the

performance space might be invaded unexpectedly by a swarm of Tettix-players sweeping locust-like through the room, ever upward until they could climb no further. The tubes were tuned and assembled in order to make achieving the final cadence a purely physical gesture for the performer, pushing the tube up to its shortest length and then pulling the entire inner tube out, thereby suddenly raising the pitch by an octave. The final dismantling of the instrument has the double benefit of being both an unexpected musical gesture and full of parallels both mythical and scientific. While the motion of the thumb that supplies acoustic energy to the Tettix is barely perceptible, the final octave leap could be accomplished with a visual flourish. With a broad sweeping motion, the player dismantles his own instrument. The Tettix is thereby ceremonially dismembered but continues to sing, an echo of both Orpheus and the vivisected cicadas of Bennet-Clark and Young's experiment.

Step six is designated to take place on 27 March, 2032. David Rothenberg comments that 'the 17 year cycle is like a great, slow beat in the animal world, a rhythm so long we can barely perceive it as a rhythm. This may be a rhythm beyond our perception.'²⁵²

Thinking through performance humanised the Tettix in its construction even as it encouraged insect-like musical behaviours, both sonically and socially. Such behaviours help counter the individualist narrative implicit in Orphean opera. The Tettix (and the performance practices it suggests) also reverses the pattern of material highbrow/intellectual lowbrow so typical of opera. Reclaimed disposable materials are put to use in the creation of mass sound textures more common to the avant-garde.

The designers of the Tymbalimba encountered similar difficulties in humanising the cicada instrument. 'It would be absurd,' they commented, 'to expect a human to buckle the mechanical ribs with a repetition rate comparable to that of a cicada,' and overcame the problem by bypassing the physical world altogether, employing a computer that 'accurately produces the sequence of impulses generated by additional buckling ribs'²⁵³ – ribs which in fact have no existence outside computer model.

Smith and Smyth recognise that the absurdity is not in our inability, but in the expectation that we should overcome it. Yet the invisible assistance of the computer lulls us into a belief that we have fulfilled just such an expectation and overcome these deficiencies unaided. The notion that humans might simply be outclassed is beyond the bounds of allowable discourse.

²⁵² Dodd, 2013.

²⁵³ Smyth and Smith, 2003: 364.

Chapter 6: Insect Singers, Insect Drummers

6.1 *Insect musicking*

The action of *Brood* is a direct imitation of insect behaviour in their emergence and ascent, and of their sound-producing bodies, in the form of the biomimetic Tettix. The short text sung by the cicada chorus, however, demonstrates an unwillingness to relinquish the security of referential meaning.

The absence of propositional meaning does not make insect sound meaningless. Cicadas do not merely sing, but actively perform, establishing and regulating social relationships with their music. While it may be nonsense to ask what cicadas are saying when they sing, we may productively consider what they are doing.

Christopher Small takes a similar approach to human music, stepping away from traditional musicology and its focus on the musical work to reach a deeper understanding of the musical event and its function in society. He emphasises an action- rather than object-oriented approach by using the noun ‘music’ as a verb, referring to the contextualised music-making event as a ‘musicking’.²⁵⁴

This reorientation allows meaningful comparison between the musical behaviours of humans and insects. Entomologists have identified a wide range of such musickings by which insects manage their social lives, with recognisable parallels in the human world. Insect chorussing, the musicking of *Brood*, involves large groups or whole local populations of insects. With human choral singing, such behaviour establishes and reinforces group cohesion, and like humans, some insects sing not only simultaneously, but in synchrony, as does the Snowy Tree Cricket (*Oecanthus fultoni*). By synchronising their song, males cooperate in the search for a mate.²⁵⁵

In fact, nearly all insect music serves at least an indirect function in reproduction, and the elaborate habits of crickets in particular are reflected in a wide variety of distinct musical interactions, from identifying potential mates and fighting off rivals to separate calls encouraging, interrupting, and immediately following copulation. Alexander identified half a dozen types of call in the cricket family Gryllidae, and at least one species has a repertoire of all six types.²⁵⁶

While the crickets with the most varied repertoire are found among the Gryllids, it is their

²⁵⁴ Small, 1998.

²⁵⁵ Otte, 1992: 35.

²⁵⁶ Alexander, 1962.

close relatives the Tettigoniidae, the katydids whose song is the most complex.²⁵⁷ The rhythmic variation in their calls makes it relatively simple for humans to distinguish some closely-related species by sound alone. Both families belong to a group known as the Ensifera, from whose name I derived the title of my own experiments in cricket sound-producing behaviours, the Ensiferan Variations.

A number of cricket musickings can be defined solely through their sonic properties, and their performative functions obscured beneath musical form. Mate-finding, however, with its specific concrete goal, is a musicking with a readily discernible outcome, and the model for the most elaborately realised of the Ensiferan Variations, *The Cricket Seeks a Mate*,²⁵⁸ performed by participants at the NW/THN symposium at the University of Sussex, June 2013.

Eunomos rather than Orpheus suggested a strategy of audience participation that might enable an even closer connection between human spectator and arthropod than in the previous pieces, moving beyond an appreciation as Other to identification, recognising the possibility at least of insect subjectivity.²⁵⁹

With the new opportunities presented by adopting the Eunomic principle of participation came new challenges. Although *Sacculina*, too, coaxed a kind of performance from its audience, *CSaM* made significantly greater demands.

CSaM made significantly greater demands on the participants. Affordances such as were present in the structure housing *Sacculina* are more reliable influences on human interactions with spaces and objects than with other independently acting human agents. Furthermore, the lack of mimetic intent and the sound of the singing voice already present in the environment meant that whatever their behaviours, the formal and experiential

²⁵⁷ The name of the family derives from the word Tettix.

²⁵⁸ Hereafter abbreviated as *CSaM*.

²⁵⁹ Cricket communication is addressed by Amy Young in her own work, particularly *Cricket Lounge*, a 'technologically-enhanced nature experience attempting to facilitate communication between crickets and humans.' (Young and Aloï, 2007: 17.) Young's strategies of re-presentation are, as she admits, anthropomorphism by other means – live crickets occupy a miniature human interior complete with furniture, rugs, and monitors on which the crickets may watch footage of their natural environment. Human participants 'interact' with the enclosed crickets via a 'telephone interface which receives the amplified chirping sounds of the actual crickets and sends voice-activated electronic chirping sounds to the crickets.' The mediated engagement is not, ultimately, communication, and the necessity of technological intervention seems to reinforce rather than erode the species barrier. My own solution to this problem, eschewing technological for more humanistic intervention, paradoxically eliminates the 'real' cricket altogether, opting instead for a strategy of embodiment seen more commonly with reference to mammalian subjects, such as Charles Foster's badgers, or Thomas Thwaites' goats. See Orozco and Parker-Starbuck, 2017: 64–67.

elements of opera would be available to them. Participants in *CSaM* needed overt instruction rather than subtle encouragement in order to produce the non-human behaviours required.

The series of actions, images, or sounds specified by the conventional performance text posits an audience to witness the event. The internal world of the performers is irrelevant except insofar as it influences what the audience experiences. With a cast of spectators, this is no longer the case. The effect on the spectator and the internal world of the performer are one and the same.

To specify an externally-observed outcome allows participants to limit their engagement to mechanically following the instructions, becoming ‘empty warblers’. Rather than offer a door to the subjectivity of the Other, such a text invites them to surrender their own agency. This does not merely hinder mimetic identification. A participant spectator simply ‘going through the motions’ in their imitation of crickets would reinforce the Cartesian model of non-human behaviour that I sought to challenge, by denying the relevance of the cricket’s internal state, or the possibility of its subjectivity.

Instead, in *CSaM*, I sought to replicate the opposing forces of desire and constraint, risk and reward, from which cricket behaviours emerge, in order to elicit analogous behaviours from the actors and enable identification with the cricket they were portraying.

6.2 *The Cricket Seeks a Mate*

Before entering the environment, each participant is given either a small box (see below) or a key, both of which have an explanatory tag (This instruction could also be repeated verbally by a performer upon the issuing of the box or key)

The environment is dimly lit, a nocturnal soundscape made of layer upon layer of faint, repeating noises and drones, which all together make an ambient noise that is just loud enough that a person might have to speak up to address a person not standing quite near. The synthetic, monochromatic environment is given colour by projections of images of undergrowth, shadowy and green, and the blue cast to the light. Large sheets and folds of synthetic materials, suggestive but not imitative of mega-scale undergrowth, tree-trunks and stones, ensure that the most of the environment is always hidden from view.

One or two performers, ‘disguised’ as participants, hide in the environment – they act as predators and will grab any participant who comes near and is moving and making their call with too little stealth.

Following instructions, the participants then make their way around the space, quietly calling out with their cricket noise as they listen out for the noise made by their own conspecific.

On finding their mate, the participants now have a box and a key - if they have indeed found the correct mate, the box can be opened, revealing it to be empty but for a small assemblage of leaves, twigs and soil, as well as a photograph of the insect both have been imitating, with a short description drawn from the scientific literature. After the box has been open for a few seconds, a speaker hidden within the box plays a recording of the actual cricket, allowing participants to hear the noise that they have unwittingly been imitating.

Can you find your mate?

By this sound, and this sound alone, you will know your mate:

zzzzzz-zik-zik

Listen carefully for it.

By this sound, and this sound alone, your mate will know you:

zik-zik

When you think you have found your mate, make this call so your mate can recognise you.

Beware - the night is full of predators. If you move too noisily, if you make your call too loudly or too often, they will eat you.



Figure 17: above, the box distributed to CSaM participants; below, the performance environment



The object of desire is indicated both by the title of the piece and the question on the card, which in combination make implicit the participant's role as a cricket, rather than requiring them to act like a cricket. Although attaining the stated goal – finding a mate – is satisfaction enough for the imitated insect, the keys and locked boxes distributed to participants suggest a more tangible reward. I hoped that establishing a less abstract motivation for the performers would free them to act less, and follow their own instincts just as the crickets did.

The avoidance of the symbolic risk of being eaten defines the constraints on their behaviour. Rather than being instructed to move slowly and make their sound quietly, they are being invited to move as quickly and vocalise as loudly as they dare. These constraints on detectability are derived from the selection

pressures that singing insects face at the species level.²⁶⁰

Emphasising that sound was the only means by which they might achieve their goal, I hoped to preclude those human solutions that would allow a participant to avoid altogether any cricket-like behaviour. Although I considered it unlikely that any volunteers would be uncooperative, the spirit of the piece must be reflected in the letter of the piece.

In using verbal notation, I created a grammatical model of behavioural system I was hoping to replicate.²⁶¹ The Darwinian imperative of instinct driving the cricket's behaviour was translated into the non-negotiable grammatical imperative. The score can be reduced to four commands: make this call, listen, beware, and move closer. The only adverb of

²⁶⁰ Ercit and Gwynne, 2015. Granting this freedom to the individual human-as-cricket, unfortunately, implies an intentionality in instinctive behaviour and a goal-directedness in evolution, a common misperception that I would prefer not to foster. The real insect does not sing as loud as he dares, but as loud and as often as he can, although he will fall silent upon detecting a potential predator. The seeming caution of his song is a matter of instinct rather than conscious decision.

²⁶¹ Lely and Saunders, 2012: 3–74.

manner, 'carefully', defines the character of the piece.

The instinctive knowledge of the cricket is represented in declarative sentences using the present simple form of the verb and the modal verb 'will', used in English to represent predictions of events based on unseen evidence. The stimulus/response of calling is also modelled with a conditional, although I optimistically used the word 'when' instead of the more usual 'if'. The only The pairs of performers have slightly different instructions, such that the 'male' cricket will initiate the exchange, and the 'female' answer; the 'male' will move to approach the 'female', the 'female' move only to avoid potential predators. The simple choreographies are derived from Arthur W. Ewing's *Arthropod Bioacoustics*.²⁶²

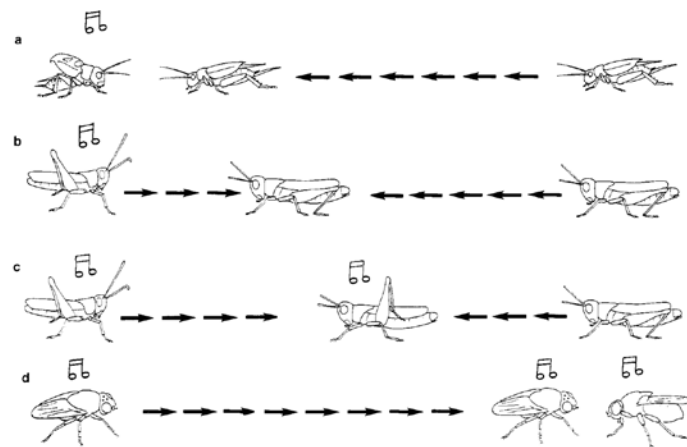


Figure 18: Insect choreographies

6.3 The performing audience

The potential refusal of a performer to play by the rules is a particular hazard of asking the audience to perform. Even participants who are inclined to co-operate may experience discomfort at subjecting themselves to the scrutiny of an observer – the most consistent misgiving expressed by the original cast.

My hope was that the different criteria for success established by the performers' instructions would help avoid this potential source of anxiety. A successful public performance is typified by a display of sufficient technical prowess, convincing mimesis, or the incitement of an appropriate emotional response – all of which rely on subjective judgements of the audience, who may differ wildly amongst themselves as to what qualifies as sufficient, convincing, or appropriate. The measure of success in *CSaM* is much less

²⁶² Ewing, 1989: 151.

subjective, the criteria more clearly defined. A successful performance is one that works – a performance in which the protagonist avoids the risks and meets his ‘mate’.

To my surprise, however, the shift from human behaviour to cricket behaviour seemed less problematic than the shift from spectator to performer. The discomfort was not the crippling stage fright of the actor, but the embarrassment of the audience²⁶³ – not, as I might have predicted, ‘I don’t feel comfortable acting like a cricket’ but ‘I don’t feel comfortable acting’.



Figure 19: Listening performers in CSaM

As actors within the world of the piece, the audience are not only subjected to the pressures of performance, but are also denied the conventional pleasures of spectatorship. The selective attention required of their role, not simply listening, but ‘listening out’ for a specific sound, prevents

appreciation of the intriguing soundscape that results from their interactions.

If the lack of distinction between audience and performer did not free the participant, as I had hoped, from a performer’s anxiety, neither did it deny them the audience response which is such an important source of performer satisfaction.

In *CSaM*, the source of wonder is in the human-as-insect interaction, discovering a stranger is suddenly a partner in a fleeting and arbitrary but intimate relationship. By eliminating the audience-performer distinction, isolating these audience-performers in an extraordinary environment, and directing both attention and behaviour, with non-linguistic interactions putting the experience necessarily beyond words, *CSaM* satisfied the conditions for ritual more completely than the self-consciously mystified *Sacculina*. Their delight at being co-solvers of the communicative puzzle can’t help but be coloured by the knowledge of the roles they found themselves taking on, as chosen, predestined mates. Finding

²⁶³ See Ridout, 2006.

belonging in their shared Otherness, they experience a sense of *communitas*.²⁶⁴



Figure 20: Audience-performers in The Cricket Seeks a Mate

Devising a pay-off to equal the sexual satisfaction that is the cricket's reward would clearly be impossible, or at least unethical, although nature provides another reward for the female tree cricket in the form of the nuptial gift, a waxy concoction of carbohydrates and lipids the male secretes from the metanotal gland on the back of his neck to prolong coitus. Although nuptial feeding is a recorded phenomenon among both humans and *Ensiferans*,²⁶⁵ translation of the metanotal secretion into human terms would require a compromise between the material and sensory realities of the insect experience on one hand, and the effect on the human participant on the other. There is simply no human equivalent.

6.4 Performing the inadequate

Although the audience were aware that they were, in a fashion, 'playing crickets', it is likely that the uninformed observer would be at a loss to identify the creature they were imitating. The environment in which the performance took place was 'suggestive but not imitative of mega-scale undergrowth', but these minimal clues, while contributing to an otherworldly atmosphere (and importantly providing places for performers to hide) offered no more specific indication.

²⁶⁴ Turner, 2012.

²⁶⁵ Bailey, 2003.

The fault here is not in the performers, who faithfully adhered to their set of instructions, but in the instructions themselves. The mimetic shortcomings are the result of human inadequacies in reproducing the sensory world of insects, which reduce the resemblance of the copy to the original at every stage like a game of Chinese Whispers. The most interesting features of insect sound are hardly available to our own perceptual systems, much less to the constraints of the systems we use to transcribe them. Even the cicada, so prominent in the human summer soundscape, overlaps our hearing range by the smallest of margins – we hear the slow bottom of their voices. In the case of the *Ensifera*, the difference is yet more extreme. Slowed down to one-quarter speed, and consequently lowered two octaves in pitch, the rattle or whine becomes a succession of tones or a mellow throb.

In the presence of the insect itself, human hearing would fail to capture the subtleties of cricket song. The performers in *CSaM*, however, did not even have that luxury, but had to rely instead on transcripts of cricket calls drawn from the entomological literature. Though their provenance lends these transcriptions the authority of science, they leave much to be desired.



Figure 21: Paolucci's 1878 attempt at insect song transcription

There is something heroically futile about eighteenth- and nineteenth-century efforts to record the sounds of crickets using traditional western music notation. Paolucci's 1878 transcript of a cricket call, dutifully recording a series of semidemiquavers on one pitch, measured into bars of four, is a typical example. As a representation of cricket sound it leaves much to be desired. Just as in *CSaM*, without the explicit label 'a cricket', it would be impossible to know whose song had been recorded. These notated transcripts appeal directly to the Platonic vanities of musical language,²⁶⁶ allying it to scientific reasoning in its search for truth, even as its shortcomings are obvious to anyone familiar with the insect sound it purports to capture. What is not contained by the rigours of transcription is irretrievably lost.

The inadequacies of these transcriptions do not go unrecognised by the scientists who produce and use them, and Paolucci cautiously uses a conditional form in introducing his example: 'This is what the musical translation *would* look like'.²⁶⁷ Attempts to capture these sounds have led to expansion of the musical language, as suggested by cicada expert J. G. Myers in his 1926 *Insect Singers*. Recognizing the inherent limitations of traditional notation while acknowledging its usefulness, he created his own system of microtonal notation.²⁶⁸

Their recognised inaccuracies notwithstanding, they serve an essential taxonomic purpose. Although insect bodies are preserved as para-Platonic holotype specimens in museums, we cannot similarly capture their voices. The song that may have identified that paradigmatic specimen may be recorded, encoded, reconstructed, but is ultimately lost. These transcripts, unlike musical scores, do not claim the status of the thing itself. The aim of entomological transcription is not to instruct a performer, but to identify him, a meaningless purpose except in the presence of the singer.

The shift to technological means of recording these sounds gradually eliminates the human, exchanging engagement for an illusion of fidelity. While some information unavailable to the naked ear may thus be revealed, the parameters of sound recorded thus visually – amplitude, frequency, and duration – are the same as those recorded by traditional notation. In the waveforms now in standard use, perfect fidelity records everything but communicates even less than mid-20th century phonograms. Without the

²⁶⁶ See Taylor and Lestel, 2011.

²⁶⁷ Paolucci, 1878: 19 translation and emphasis mine.

²⁶⁸ Though Myers' innovation was roughly contemporary with composers' experimentation with microtonal notation, Guillaume-Hyacinthe Bougeant had suggested the same nearly two hundred years earlier, although he baulks at transcribing the sound of what he speculates (correctly) might be an insect musicking. See Bougeant, 1740.

aid of a computer, only rhythm and intensity are apparent. We trust them primarily because of their origins in machines.

I narrowly escaped falling prey to the seductions of perfect fidelity in the construction of the boxes. The original specification called for the united pairs to be rewarded with the actual sound of the katydids they had been imitating, emerging as if by magic as soon as the box was opened. Such effortlessness and accuracy proved beyond the limitations of my engineering skills and available consumer technology. Instead, participants had to push a button to play a tinny, barely-audible recording of a katydid that was barely discernible from white noise. I hope that for some, at least, this sterile bit of machine magic was a disappointment in comparison to the joyfully inadequate voices of their fellow humans, or the yet-unheard songs of the insects they had fleetingly become.

I do not deny that digital transcripts of sound are an irreplaceable tool for scientists who are aware of their limitation. This awareness is the product of contact with the insects themselves. For the layman, living in a modernity defined in part by a mediated experience of non-human nature, the opportunities for such contact are more limited. In a culture awash with neotenised caricatures of cute animals, we escape charges of sentimental anthropomorphism by retreating into inevitably reductionist scientised portrayals, an overcorrection termed ‘anthropodenial’ by Frans de Waal.²⁶⁹

Performance-as-animal cannot happen without violating the third-person objectivity demanded of scientific discourse. It is this violation which allows us a greater understanding of the organism that objectivity cannot allow. The animal mimesis of *Arthropoda* offers a ‘countermodel to scientific denotation’²⁷⁰ and points towards a different kind of knowledge.

Arguably, the encounter with the real animal, as in ‘*Sacculina*’, is the only route to genuine identification. In such an encounter, however, confronted with the irretrievably Other, we look for similarities, question the subjectivity of the creature. In a performance such as *CSaM*, identification is a precondition for participation rather than simply a desired result.²⁷¹

For the performer, the impossible mimetic work has been done by the transcription, allowing pleasure to be taken in the inevitable failure to reproduce the target sound. In contrast, the pressures of producing the perfect execution implied by score-based practices,

²⁶⁹ de Waal, 2005.

²⁷⁰ Ham and Senior, 1996: 2.

²⁷¹ Taussig, 1993.

or matching the perfect reproduction of electronic recording, contribute to a sense of dissatisfaction that might be termed the masochism of virtuosity.

6.5 *Found Scores: The Influence of Light*

The score's role in generating ever more elaborate performances, as well as training the musicians who play and compose them, has made it simple to confuse the score for the music itself. Paul Théberge characterizes the transition in the score's place in Western music as a shift from a descriptive to a prescriptive role.²⁷²

Transcripts of insect sound are, of course, descriptive, and though insect sound transcriptions have been subject to the same technological change as the score, the function of these transcriptions has stayed the same. They are found primarily in taxonomic keys in association with a short description of the distinguishing physical characteristics of the insect in question. They encode enough information for an observer in the presence of the insect sound to distinguish them from other species that may be nearby.

These transcriptions exist primarily in isolation, and different entomologists have preferred methods. Most transcriptions are onomatopoeic in nature, like the ones given to the participants of *CSaM*, describing insect sound with reference to a human sound system, the non-vocalic nature of insect sound making these transcriptions replete with consonants. Others will use musical notation, or less frequently, a verbal description of another possible source of the sound.

While most of these transcriptions exist in isolation, two works rely heavily on these transcripts. The first, J. G. Myers' *Insect Singers*,²⁷³ is a survey of the cicadas of New Zealand, and uses primarily staff notation. The second is Frej Ossiannilsson's *Insect Drummers* (1949), a guide to the sound-making Auchenorrhyncha, the suborder to which cicadas and their smaller relatives, the leafhoppers and planthoppers, belong.

Ossiannilsson was a lover of classical music, and a keen violinist as well as an entomologist,²⁷⁴ a fact made apparent not only in his notated transcriptions, but in his experimental set-up. The sounds of many of his subjects being too quiet for insensitive human ears, he set them on his violin so it could act as a resonator. He refers to violin sound in a number of his descriptions of insect calls, which employ a broad range of techniques: reference to musical instruments and to non-musical sounds, musical notation,

²⁷² Théberge, 2005.

²⁷³ Myers, 1929.

²⁷⁴ Prof. M. Claridge, email to author, 15 November 2013

and standard onomatopoetic words as well as his own coinages.

Beyond the vast number of different insect calls, and the range of transcription styles he used, Ossiannilsson also recorded the times and dates of his observations. In addition, he conducted²⁷⁵ tests to determine the factors that influenced the musicking of his experimental subjects. Here was a document that carried in it all the elements of an opera score – voice, text, time, instrumentation – even gesture and narrative. Although it had a descriptive rather than prescriptive function, it easily served as a set of instructions to performers.

The participants in *The Cricket Seeks a Mate* were spontaneous volunteers, and the scope of the piece was limited by what could be communicated to them in as short as possible a time. For the Ossiannilsson, more time could be spent in realising the text, exploring the possibilities of recasting a scientific text as a musical score, adapting it from its descriptive to a prescriptive function.

Our first Insect Opera workshop culminated in an attempt to recreate his 1947 experiment, *The Influence of Light*.²⁷⁶ In re-sonifying the work, we approached the text as though it were the work of a composer. While the guiding principles of Eunomic opera abided, the written score could not be dispensed with, nor was it held in any less regard.

The Influence of Light encodes sound events in unfamiliar ways. Although information about timbre and time are encoded, pitch and rhythm are not. Ossiannilsson's record of sound events are recorded in a table that specifies the number of calls made by a group of individual insects in a series of fifteen-minute periods.

The species he used for these experiments were *Empoasca viridula (decipiens)*, described in transcription as 'a short laughing sound: "hahahaha"'.²⁷⁷ and *Zygina (Erythroneura) hyperici*, described as 'a short weak note sounding as if produced by a strong lash in the air with a hard flexible switch'.²⁷⁸

We started by exploring the sound-making possibilities of the instruments and vocal gestures Ossiannilsson specifies, deciding individually how we would define our calls. The instruments were acoustically inefficient, sometimes requiring great force to make a sound, sometimes even breaking.

After finalising our calls, we worked on the score itself. The unfamiliar freedoms of the

²⁷⁵ Scientific experiments, like musical works, can be conducted or performed.

²⁷⁶ pp 120–24.

²⁷⁷ p 96.

²⁷⁸ p 98.

score made it impossible to sight-read effectively, so we agreed on a method of interpretation in which the beginning of each period would be signalled by a conductor.

Although I served as conductor, I had no influence over the piece except as timekeeper, a role we agreed would be better performed by a clock in further iterations. We chose an arbitrary multiplier in order to make the piece fit a reasonable time frame.

In moments of musical indecision, we considered the source material and the insects whose sound we were reproducing, although none of us were actively playing roles. The laughing call of the *Empoasca* performers was clearly a call rather than a recreation of a human laugh.

Though the score left a number of musical parameters unspecified, we spontaneously created repeated figures or textures reminiscent of insect musickings, leading to a piece of unexpected variety and musical interest – Antiphonal textures, sudden shifts in tempo, solo passages, and long silences all emerged in our sound interactions. The freedom gave a distinct urgency to conforming to the minimal guidelines.

The descriptive/prescriptive typology adopted by Théberge proved insufficient to accommodate a performance text with both the function and character of the adapted transcripts of *CSaM* and *The Influence of Light*. While they were definitively descriptive texts, their new manifestations did not have the authoritarian and inflexible character that ‘prescriptive’ implies. Yet repurposing these texts involves a fundamental shift in our relation to them.

The clue lies in this word ‘repurposing’: the descriptive/prescriptive system applies to texts which offer a set of encoded instructions for the creation of a performance. The entomological transcripts were produced only as a way to record a pre-existing sound. While it is possible that a transcript might serve both these functions, as does written language, the distinction between their generative and documentary roles is clearly defined.

Prescriptive and descriptive lie at two ends of a spectrum, characterising the degree to which the transcript, the reified sound, is a reflection of the sound that it stands in for. Though etymologically dissatisfying, these terms are already used to characterise this spectrum, and following taxonomic practice, should not be discarded, but can be supplemented by making the generative/documentary distinction. This describes more accurately the shift from documentary to generative function of the insect transcripts I used, while not implying a change in their minimally prescriptive character.

The lack of distinction between character and function, the conflation of descriptive with

generative, becomes an issue in documentation of performance.

Wyman's concern over inaccuracies of recollection, her criticism of the entombment of the artefacts of performance in museums as 'fondness for objects that are dead' does not recognise the fatal role of documentation itself. Her warning that 'the post-performance object is only a fragment of the referenced whole'²⁷⁹ assumes that a performance is in itself a whole, a thing bounded in time and space, limited to the circumstances of its first production. The impulse to create a unique ur-object from an event is inherited from the art world. The document is too easily confused for the thing itself.

For all its misuses, a score is an invitation. While a performance preserved through its documentation can only be imitated or reproduced, the score itself serves a performative function, as 'a set of instructions and an authenticating device', allowing subsequent performances to take place.²⁸⁰

The experience of *The Influence of Light* was a salutary reminder of how much the performing musician can contribute to the sonic content of a musical event in the absence of a pre-existing musical work. We underwent a standard rehearsal process in preparation for a complete, satisfying performance, culminating in a performance of the piece and not to a separate audience, meeting independent criteria. We were no less deeply involved in the creation of the piece than if it had been a test of our technical prowess, and the degree of our engagement with the realisation of the score can be measured by the reaction to the interruption of our first run-through.²⁸¹ The involvement of at least one avowedly tone-deaf, entirely untrained performer in this miniature opera, this musicking, is a testament to the benefits of adopting Eunomic principles.

6.6 July, 1945-47: *the score*

The origins of *The Influence of Light* in a scientific text fostered a spirit of experimentation and enquiry that can be lacking in traditional music making. With a score that did not present a goal to reach, but a place to start, the question was not the engineer's 'how do we achieve this?' but the scientist's, 'what can be achieved?'

The success of *The Influence of Light* encouraged me to ask the same question of a much larger-scale musical event that lay in fragments in *Insect Drummers*. While Ossian Nilsson's work is arranged by species, my particular focus was the sounds themselves, and I collated

²⁷⁹ Wyman, 2007: 35.

²⁸⁰ Miller, 1986: 35–40.

²⁸¹ In accompanying documentation, *Influence of Light* interruption.

“,,,,,,,,,,,,, . . .” and so on.

This song was registered on the radiograph on 18 July, 1947, at 8.40 p.m.²⁸³

Not intending these sounds to be reproduced, he relies on recollections of the ghosts of lost sounds — remembered sewing machines, phantom chairs drawn along wooden floors, the remnants of imagined gestures with non-extant objects. This complicates attempts to bring the sounds back to life. He relies on notoriously unreliable English orthography to carry his message. The ‘rattle of a harestop’,²⁸⁴ which I had assumed at first to be a natural object, a seed pod of some kind, turned out to be no plant at all but a ratchet. The word has fallen from use in contemporary Swedish but a harestop would have been a familiar object for mid-century farmers beleaguered by crows.

Surveying the objects and instructions I had assembled for the performance, I realised that he was the human subject of an insect opera. With his use of Morse telegraphs, cranked motorcars refusing to start, precise playing instructions for the violin, and linguistic

²⁸⁴ in *Doliotettix pallens*, page 92.

transcriptions with diacritics drawn from Latin, the author has inescapably encoded himself and his own surroundings, his own *Umwelt*. *Insect Drummers* is a record of the sounds produced by Swedish Auchenorrhyncha. It is also a record of summers spent in the countryside north of Stockholm, just after the end of the Second World War — as the ‘fire of a distant machine-gun’ in the description of *Lepyronia coleoptrata* reminds us. The medium of his transcriptions is transparent, not as a sheet of glass, but as a lens or a prism, and the aural images of the insects are refracted through the purposes, preoccupations, and contexts of a human personality.

As performers, we were freed from the constrictions of ‘authorial intention’ — the performance of these sounds is not his intention, but ours. Yet this is not an elimination of all responsibility.

The score is both non-negotiable and subject to interpretation. How can we express our fidelity to the score, or to the source material, or to the subject, insect or human? To what person or principle are we being faithful? What are the consequences of an infidelity? Does the performance then become a lie, a betrayal? Recasting our fidelity from faithfulness to the score to a faith in the score allowed the earnestness in our attempts not to be clouded by the certain knowledge that we would fail in the sort of fidelity demanded of traditional opera personnel.

Certain adjustments were made to make the piece more conveniently performable: we limited ourselves to sound observations he had made in the month of July, and took into account only the time of day in ordering the events, leaving us with a 24-hour score. While this might have its own interesting effects, we condensed these 24 hours into 24 minutes. This time scale created a change of musical texture such that the evenings, recreated between fifteen and twenty-one minutes into the piece, became frantic, while the opening was nearly silent.

Ambiguous descriptions were standardised so that each description produced a single gesture. Objects that were excessively impractical were replaced with near equivalents, although this equivalence might be material or sonic. The Morse telegraph, for example, was replaced by a typewriter, although I felt it appropriate to find a manual typewriter and a 1940s sewing machine in order to retain some of the period atmosphere.

For the vocal parts, we adhered to the text and the description where possible, assuming freedoms within that range. Although some of the sounds he transcribes are also recorded, we did not use these recordings in rehearsal, but instead based our performance solely on the transcriptions.

In keeping with the both-and character of insect singing, *July* is a musical performance and a piece of theatre, the players simultaneously acting and not-acting.

Ossiannilsson does specify various sonic interactions between insects — to the description of *Philaenus spumarius* is added 'readily chorusing!' The 'amoebochronous duet' for *Leptyronia coleoptrata* became a recognisable theme.

Looking for further opportunities to make sounds collaboratively, we find descriptions that demand more than one voice, or insects described in two different ways that might be performed simultaneously. We distributed the objects in inconvenient and inefficient ways, compelling approaches and retreats that hinted at relationships between players and their instruments that went beyond the sounds they were producing.

More rehearsal time could have been spent analysing our own spontaneous reactions, examining musical behaviours and interactions as evidence of (human) personalities and relationships, creating "characters" for ourselves. There seemed no need, however, to go to such Stanislavskian extremes. Our motivations were much clearer — make the sound as instructed. Questions we might ask of the singers on stage in an opera – who is your character? What is your motivation? -- would be absurd addressed to a member of the orchestra. In *Insect Drummers*, both are happening at once.

6.7 July 1945-47 in performance

My hope was that the audience would feel more free to explore the performance space as *July* unfolded, but old habits die hard, and while there was some cursory wandering about as the performers set up, the audience by and large remained seated, unwritten rules adhered to. Empty chairs intended for spectators set amongst the instruments remained empty. An invitation to participate must be made more explicit than mere affordance.²⁸⁵

The performance begins with looks of consternation in the audience – the cue to begin has come and nothing is happening. An agreement has somehow been violated, or there is a significance in the moment that we cannot detect. The questioning glances of the audience turn gradually to a more engaged attention as one of the instrumentalists is seen to be poised, ready to make a sound. For three minutes he stands on this brink, until they all pluck their balloons, interacting both sonically and physically. Their motions are directed not at the audience, but at one another, establishing a kind of fourth wall which is an analogue of the species barrier.

²⁸⁵ Kershaw, 2001; White, 2013.

Then more silence. The audience has gone from engagement to boredom to engagement-with-boredom. They eventually realise that if they do not choose to leave, they must simply wait it out, and approach the piece not with the expectancy of a circus goer, but the patience of a naturalist, for whom a sighting, much less a witnessed new behaviour, is a noteworthy occurrence.

After the long, prescribed silence at the beginning of the score, the performers allowed themselves the freedom to make a noise, which would most often be taken up by the others, as in cricket or cicada chorusing.

Nearly five minutes after the piece has begun, a performer moves from behind her music stand, crossing the boundary between music and theatre. Each musical/instrumental encounter thereby becomes a scene between two performers rather than a purely sonic reconstruction of a decontextualised insect noise. She approaches another performer and momentarily takes over his violin, wielding a stick in a literal *col legno* – the instruments are objects to be used, but not, as in usual orchestras, to be exclusively owned.

No performers react to the unearthly noise emerging from this non-standard collaborative violin technique. Are they the opera or the orchestra? Why are they silent? Are they playing instruments or ‘playing insects’? A non-violinist hacking away at an instrument with only two strings, and those entirely untuned, is a signal that the beautiful sound or virtuosic display that typifies musical performance is not the aim here. The seemingly random use of voice, body, or instrument as expressive object further confuses long-established boundaries and easy preconceived relations with the audience.

Their musical interactions are full of competitions and co-operations, moments suggestive of relationships that are incompletely communicated to the audience. In a burst of noise, a trumpeter charges forward, stamping his feet. The use of voice announces the subjectivity of these performers, implies that they are more than mere sources of sound. The methods of making these sounds that Ossiannilsson has specified leave a semiotic residue.

The performance event suddenly takes priority over any pretensions of mimetic accuracy. Mad rushes and urgencies create a mismatch between intensity of gesture and intensity of sound, drawing attention away from the sound itself towards the context of its making. Even if we know that the players are not communicating but merely reconstructing, pretending to communicate, feigning meaning, we cannot help ourselves. A performer hastily typing seems to be sending an urgent message, although it is clear from the way he types that the message will be incomprehensible.

What did that message mean? What did *July* mean?

6.8 You had to be there

July, 1945-47 presents a challenge to an audience accustomed to well-made drama, in which every detail of the performance belongs to a single semantic system and contributes to the meaning of a piece as a whole. In the absence of an accessible semantic system to guide the audience,²⁸⁶ *July* becomes a spectacle of ‘pure presence’. Yet our human nature as the symbolic species suggests that we carry this semantic system wherever we go. It is the system that gives us language, and therefore defines us.²⁸⁷ Our innate impulse to construct narrative from a sequence of random occurrences is central to our understanding of film. It manifests in the anthropomorphising tendencies that make puppetry possible.²⁸⁸ At its extremes, the meaning-generation faculty results in the pareidolia that sees Jesus in toast or the apophenia of magical thinking. These delusions of manufactured meaning are not specific to humans, however.²⁸⁹ We do not have a monopoly on meaning.

As glib as it may sound, to understand the meaning of *July*, you had to be there.

The pure presence of ‘being there’ is more than a physical presence at the performance event. Presence is a product of participation, mutual trust. Performers and spectators alike must surrender to the possibilities of engagement offered by the performance paradigm. Arnold Berleant’s notion of engagement applies here: ‘perceptual receptivity, directness of presentation and immediacy of awareness, somatic participation, concentration on the intrinsic qualities of perception and meaning, collaboration with the artist and performer as part of the appreciative act’.²⁹⁰ Importantly, this definition does not exclude meaning.

An experience of engagement is clearly not meaningless, despite their resistance to description. Cognitive scientists still struggle to capture and communicate the essence of ‘pristine experiences’, which are ‘experiences in their natural state, not disturbed by the act of observation, unplanned, unpremeditated, unmapped, un-“figured-out” already, uninterpreted, un-heuristicized real experience.’²⁹¹ These are thoughts that have not yet been put into words.

As Carolyn Abbate observes, engaging in analysis or deduction of the performance

²⁸⁶ It is this access that *July* lacks rather than a system itself. One audience member commented on the stochastic appearance of the performance; however, the appearance of randomness did not result from a stochastic composition process, but from the observations it re-presents.

²⁸⁷ Deacon, 1997.

²⁸⁸ Heider and Simmel, 1944; Severson and Lemm, 2015; Morris and others, 2000.

²⁸⁹ see, for example, Shull and Grimes, 2006.

²⁹⁰ in DeCoursey, 2016: 266.

²⁹¹ Hurlburt, 2011: 50.

prevents engagement with the performance.²⁹² You have to be there. The presence of ‘being there’ is a presence that seems counter-intuitively to insist on absence, because it requires the toddler-tyrant Reason in our forebrains to stay momentarily quiet.

Reason demands meaning when what it seeks is explanation. Reason thinks noisily, in words, assuming that they are the substance of thought. Reason claims even subjectivity for itself. My third-person account of the performance of *July* is not an attempt at a feigned objectivity. Of course, I was that performer, but Reason’s “I” had nothing to do with it.

No successful performance is a display of what “I” can do. It is a demonstration of what can happen when “I” relinquishes the hegemonic grip on subjectivity assumed by language. The non-judgemental framework of Eunomic opera, the descriptive-generative score, the tolerance of inadequacy, the shift from ‘can I make this happen?’ to ‘what happens when...?’ all contributed to an experience of flow,²⁹³ of genuine presence, of being there.

²⁹² Abbate, 2004: 505–6.

²⁹³ see in particular Csikszentmihalyi, 2002.

Conclusion

Insects have already begun to occupy a more prominent niche in the creative ecosystem, as the recent establishment of both journals () and festivals (Pestival) of insect art can attest. Fittingly, like the phylum that inspired it, *Arthropoda* continues to evolve and diversify. *The Cricket Seeks a Mate* has been performed again, this time in the repurposing spirit suggested by the Ossiannilsson percussion and including many of the object-instruments collected for *July 1945-47. Brood II* will amass in Brighton in September 2017. In fact, adding to this suite of performances could easily become a life's work, taking deeper forays in each of the directions identified thus far.

Entomological literature abounds with stories that could contribute to a substantial repertoire of 'conventional' insect opera, as typified by *Life Stories* or staged music encounters in the spirit of *Sacculina*. Other instruments like the Tettix, based on insect physiology, particularly the stridula,²⁹⁴ pave the way to further insect musickings. The recreation of the non-vocalic sounds of insects leads us to an opera without vowels, a radical subversion of operatic technique made suddenly obvious. A focus on insect *Umwelten* and new advances in the study of their acoustic behaviour suggest an opera made of song not heard through the air, but felt as vibrations through the substrate, in the manner of the courtship of spiders or the drumming of rival stoneflies.

Although the fact that insects provide such an easy route to post-operatic practice is not coincidental, the sudden abundance of compositional strategies suggested by the 'entomological turn' taken in *Arthropoda* has resonance beyond insect representation. The musical performance of taxonomic keys, as seen in the staging of Ossiannilsson's work, might easily be extended to an operatisation of the whole corpus of bioacoustic literature. Ventures beyond insects to other singing animals has led me to explore the possibilities of a new musical prosthesis called a Syrinx, a machine to turn human voices into birdsong, which I plan to use in a new operatic retelling of the metamorphosis of Procne, a post-modern response to Milton Babbitt's landmark *Philomel*. The singing of humpback whales, the discovery of which proved crucial to the cultural reimagining of cetaceans and to the environmental movement in general, provides us with another voice, another mind, which demands unconventional means of theatrical representation. The performed confrontation between self and Other inherent in animal opera proves to be a fertile source of the 'radical

²⁹⁴ There are hardly two parts of an insect that are not rubbed together by some species to make a sound. A wearable 'stridulum suit' might serve as an acoustic answer to the panoply of new musical interfaces that rely on digital technology to allow a wider range of sonic gestures or audio embodiments.

continuities' of post-operatic experience.

Post-opera, as Jelena Novak observes, is a practice at once post-dramatic and post-modern.²⁹⁵ Insect opera in particular, along with animal opera more generally, satisfies both of these conditions, and adds another productive 'post-' to the list – post-human. Although this may conjure up images of a post-organic future, this need not be the case. Parker-Starbuck's main argument for 'cyborg theatre' – that the post-human future of the technologically altered human is already upon us and therefore demands theatrical representation²⁹⁶ – applies even more compellingly to greater on-stage representation of 'humanity'. The countless attempts to bring opera forward through use of digital technologies risk falling under the spell of a machine post-humanism which, as Linda Williams points out, is merely an extension of the same old Enlightenment anthropocracy, in which 'the animal as a figure of genuine alterity, a voice from the nonhuman world, is silenced by the voices of human invention.'²⁹⁷

Opera has always been a performed philosophy, and its dramaturgy has kept its core feature, the experiences of wonder, safe from reason,²⁹⁸ making opera one of the few places that we can claim wonder's ethical affinities: wonder is life-enhancing, other-acknowledging, compassionate, gentle, and humble.²⁹⁹ Scepticism and irony can make such values seem embarrassing reversions to the pre-Modern. But while 'embarrassment and reversion are difficult', Abbate reminds us, they are 'to be entertained for precisely that reason.'³⁰⁰

Not that these anti-Enlightenment values are intrinsically naive. Ironically, advances in the natural sciences have begun to reveal the truth of the ideas implied by the term 'human nature'. The animist beliefs of childhood are recognised as evolutionary progress.³⁰¹ Enlightenment is just catching up with the knowledge it has resisted,³⁰² truths beyond the limits of language, as defined by Ludwig Wittgenstein. 'Those things we cannot speak about,' he tells us, 'we must pass over in silence.'³⁰³

²⁹⁵ Novak, 2015. See also page 78 of this thesis. The reinvention of the singing body central to Novak's notion of the post-operatic resonates with the foregrounding of the animal body in animal opera.

²⁹⁶ Parker-Starbuck, 2011: 1–6.

²⁹⁷ Williams, 2009.

²⁹⁸ Russel Hurlburt obliquely confirms this, noting that his subject's 'use of the term "wonder" is an important clue in discovering that her experience is unsymbolized thinking'. 294.

²⁹⁹ Hepburn, 1984.

³⁰⁰ Abbate, 2004: 530.

³⁰¹ Bjorklund, 1997.

³⁰² Bernstein, 2001.

³⁰³ Wittgenstein, 1961.

Half-humans and hybrids: The Minotaur

With what are nearly his final words, 'Now I can speak. Now I am almost human. Now it is time to die,' the Minotaur in Birtwistle's opera of the same name offers his own solution to the enigma of his animal identity.³⁰⁴ From the mouth of the Minotaur, even the outwardly simple word 'now' becomes ambiguous, denoting both a moment in time and a causal relationship. Now that he can speak, he is almost human. Now that he is human, it is time to die.

Ariadne's account of his conception and birth reveal that like the satyrs rejected by Linfea, the Minotaur's origins, too, are 'half-divine and noble.' The Satyrs embody their dual nature, however, in comfortingly obvious ways. Divinity, nobility, speech, and mind are all packaged together in their upper, 'human' half. Animality takes its proper place beneath. Their furry goat-legs may be unclothed, but their state of nature precludes the possibility of nakedness.

Satirino's divine half exists in clear opposition to his animal half. For the Minotaur, result of an unnatural coupling between Pasiphaë and Poseidon's animal avatar, the two are inextricably linked.

The Minotaur's body is both inside-out and upside-down. He must endure either the shame of the naked human or the ridicule accorded to the clothed animal. With only an inarticulate bull's voice, he cannot wield the subjective "I" to announce his personhood. Yet in overcoming his silence and claiming his humanity, he must surrender both immortality and innocence.

The divine animality that represents for Calisto a state of permanent grace marks out the Minotaur as both object and instrument of retribution. His very existence is a punishment for sins not his own. The Minotaur violates the Cartesian fiction of a nature divided between human and animal; he exposes the tragedy of the human animal divided against itself.

His horror at his own (in)human nature, his lack of control over primordial desires, reflects a late twentieth-century recognition that the reasoning mind is, evolutionarily speaking, a late arrival to the primate body. Our Pleistocene pre-frontal cortex is perched unsteadily atop the lizardly limbic. The human subject is a spectator who can only watch in bewilderment as the body that contains it refuses to submit to the irrefutable authority of Reason.

³⁰⁴ Harsent and Birtwistle, 2008; Birtwistle, 2008.

For all our Enlightened scepticism, Reason demands that we succumb at least to one basic illusion – that thought precedes action, that mind directs body – when all the while we are doomed to be merely passengers, the disconnect between intention and action giving lie to the notion that the bodies we ride in are somehow ‘ours’. We recount the doings of our bodies in an absurd continuous micro-retrospect, forced to explain the fatuous ‘reasons’ behind their behaviours, taking responsibility for an unruly animal being that only occasionally follows instructions.³⁰⁵ In the words of Ursula LeGuin, ‘That was his wish; but his will was other.’³⁰⁶ Slippages are dramatic, hilarious, shameful, serendipitous, transcendent, tragic – in short, the whole operatic range of human experience that the rational protagonist cannot account for. Those things we cannot speak about, as animals in opera, we may yet sing.

³⁰⁵ Gray, 2006.

³⁰⁶ LeGuin, 2012.

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Figure 2 from *Mémoire aptérologique*, 1804. <http://docnum.u-strasbg.fr/cdm/ref/collection/coll13/id/52766>

Figure 3 by Sinibaldo Scorza. <http://www.cambiaste.com/it/asta-0223/sinibaldo-scorza-voltaggio-1589-genova-1631.asp>

Figure 4 by Angelo Bronzino.

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Figure 6 Engraving by Valerio Spada. From Alm, 2003.

Figure 7 from *Urania's Mirror*, by Jehoshaphat Aspin, 1825, restored by Adam Cuerden.

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Figure 8 by Jean-Baptiste Chardin, 1751. <http://www.louvre.fr/oeuvre-notices/la-serinette> ; Serinette from the Museum of Musical Instruments in Leipzig, <http://www.radiomuseum.org/museum/d/museum-fuer-musikinstrumente-der-universitaet-leipzig/>.html

Figure 9 from *The Far Side*, by Gary Larson. Image widely available.

Figure 10 centipede by Katja Schulz, 2015.

[https://commons.wikimedia.org/wiki/File:Soil_Centipede_Mother_With_Offspring_\(23114472511\).jpg](https://commons.wikimedia.org/wiki/File:Soil_Centipede_Mother_With_Offspring_(23114472511).jpg) ; Earwig by Tom Oates, 2010. <https://www.welcomewildlife.com/wildlifes-good-mothers/>

Figures 12-14 by Evelyn Ficarra.

Figure 21 from Paolucci, 1878.

Arthropoda on Documentation Disc:

Video: *The Cricket Seeks a Mate*

Video: *Sacculina* Encounters 1&2

Audio: *The Influence of Light* workshop

Audio: Tettix workshop

Video: *July, 1945-47*

Epilogue

Late in May, in the hills above the Ohio river, the treetops were filled with singing when my father died – Brood V had burst forth, too overwhelmingly alive to be confined so long to earth. Nature graced his passing with noise and wonder. No less would do.

Douglas Newcomb Grize (1942-2016)

Lt Col USAF, JCS Plans and Policy Directorate J5; FOBG

"Make it happen."